

**United States Department of the Interior**  
**Bureau of Land Management**

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**Environmental Assessment**  
**DOI-BLM-UT-C030-2017-0010-EA**

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**June 2017 Oil and Gas Lease Sale**

***Location:*** Color Country District, St. George Field Office  
Washington County, Utah

***Applicant/Address:*** U.S. Department of the Interior  
Bureau of Land Management  
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## **1.0 PURPOSE & NEED**

### **1.1 Introduction**

The Bureau of Land Management (BLM) has prepared this Environmental Assessment (EA) to disclose and analyze the environmental consequences of offering an oil and gas lease sale in June, 2017 and the subsequent issuance of oil and gas leases for three parcels (proposed action), which collectively encompass approximately 4,730.14 acres of land administered by the BLM St. George Field Office (SGFO) in Washington County, Utah. This EA is a site-specific analysis of reasonably foreseeable impacts that could result from the implementation of the proposed action or alternatives to the proposed action. This EA will assist the BLM in project planning, in ensuring compliance with the National Environmental Policy Act (NEPA) and in making a determination as to whether any significant impacts could result from the analyzed actions. Significance under NEPA is defined in the Council on Environmental Quality (CEQ) regulations on implementing NEPA at 40 Code of Federal Regulations (CFR) 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of Finding of No Significant Impacts (FONSI). A FONSI statement based upon this EA would document the reasons why implementation of the selected alternative would not result in significant environmental impacts (effects) beyond those already addressed in the Proposed SGFO Resource Management Plan (RMP)/Final EIS (1998); this EA is tiered to the analysis provided in the Final EIS. The proposed action is in conformance with management decisions included in the SGFO Record of Decision and RMP, approved in March of 1999.

Based upon this EA and an associated FONSI, a Decision Record may be signed authorizing an action, which could be an alternative or a modified version of an alternative addressed by this EA and described in the FONSI, for which it has been determined that significant environmental impacts are not likely to result. However, if it is determined that an alternative analyzed by this EA would likely result in a significant environmental impact, if such an alternative is to be further considered for potential approval, the potential impacts of that alternative would be addressed in an EIS.

### **1.2 Background**

The BLM's policy is to make mineral resources available for use and to encourage their orderly development to meet national, regional, and local needs. This policy is based in various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Sec. 5102(a)(b)(1)(A)) directs the BLM to conduct quarterly oil and gas lease sales in each state whenever eligible lands

are available for leasing. Leases would be issued pursuant to the regulations contained in 43 CFR Subpart 3100.

Expressions of Interest (EOIs) are submitted by the public in order to identify (“nominate”) specific public lands that the individuals and entities submitting the EOIs want BLM to offer oil and gas leasing and development. In general, the BLM Utah State Office (USO) conducts quarterly competitive oil and gas lease sales in order to respond to requests from the public that it offer certain nominated public lands in Utah for oil and gas lease. The BLM divides the lands nominated in EOIs into logical lease parcels, which will be considered for potential offering at a competitive oil and gas lease sale. The individuals and entities that submit EOIs which includes split estate lands – private surface/Federal minerals – must provide, with the EOI, the name and address of the current private surface owners(s). When a split estate parcel is under consideration, the BLM sends an initial letter to the surface owners(s). This letter informs the landowner that an EOI has been received which involves their surface ownership. The initial notification letter also provides notice of the scheduled lease auction and it invites the surface owner to participate in an on- site visit to the parcel. After a parcel has gone through an interdisciplinary review, if it is recommended for leasing, a second letter is sent to the private surface owners for parcels containing split estate lands. This second letter to private surface owners provides additional information regarding BLM’s regulations and procedures for Federal oil and gas leasing and development on split estate lands.

In the process of preparing a lease sale, the BLM USO compiles a list of lands nominated and legally available for leasing, and sends a preliminary parcel list to the appropriate District Office where the parcels are located. Field Office staff then review and verify that the parcels are in areas available for leasing and determine if any new information has become available, or any circumstances have changed in the time since the subject lands were identified as open to leasing in the applicable resource management plan (RMP). The parcels are then assessed to determine what level of analysis is required and the appropriate stipulations and notices to be applied to each parcel. Appropriate consultations are conducted, when necessary, and any special resource conditions are identified for potential bidders. In most instances, the Field Office where the parcels are located will prepare an EA in order to identify and analyze the potential impacts of leasing the parcels in accordance with the requirements of NEPA and other applicable laws, regulations and policies.

After a draft of the EA is complete, that document and an unsigned FONSI (if appropriate) are made available to the public for a 30 day public comment period by posting the documents on the BLM National Register for NEPA documents found at this link:

[https://eplanning.blm.gov/epl-frontoffice/eplanning/nepa/nepa\\_register](https://eplanning.blm.gov/epl-frontoffice/eplanning/nepa/nepa_register). The draft EA, which includes a proposed parcel list and the lease stipulations and notices applicable to each proposed parcel, the unsigned FONSI, as well as other information and instructions for the subject oil and

gas lease sale, are also made available through the BLM Utah's Oil and Gas Leasing website. The BLM also typically issues press releases to publicly announce the public comment period for the draft EA and unsigned FONSI.

Following the conclusion of the public comment period for the draft EA, the BLM analyzes, responds to and incorporates (where appropriate) all substantive comments received during the public comment period and changes to the document and/or proposed lease parcel list are made, if necessary. The EA, with any revisions determined appropriate following the public comment period, and, if still considered appropriate, an unsigned FONSI are again made available to the public through the concurrent posting of those documents and a Notice of Competitive Lease Sale (NCLS) at least 90 days in advance of the scheduled lease sale. The posting of the NCLS, EA and FONSI initiates a (30 day) public protest period for the proposed lease sale offering that will end 60 days before the scheduled lease sale. The stipulations and notices applicable to each parcel proposed for lease will be specified in attachments to the NCLS. If any changes are needed to the parcels or stipulations and notices identified through the NCLS, an erratum is posted to the BLM Utah's Oil and Gas Leasing website, and in the public room for the BLM USO, in order to notify the public of any such changes. The lease parcels, as identified by the NCLS and any errata to the NCLS, would be offered for sale at a competitive oral auction tentatively scheduled to be held at the BLM USO in June 2017. If a parcel of land is not purchased at the lease sale through competitive bidding, it may still be leased noncompetitively during the two year period that follows the offering of the parcel at the competitive lease auction. Any leases issued would be issued for a ten year primary term, after which the lease expires unless oil or gas is produced in paying quantities. The term for a producing lease can continue indefinitely while oil or gas is being economically produced.

Before any surface disturbances related to oil and gas development may occur on a lease, the lessee or operator for the lease must submit an Application for Permit to Drill (APD) (Form 3160-3) to the BLM for approval and an approved APD must be obtained. The standard lease terms contained in the standard lease form (Form 3100-11) along with any stipulations attached to the lease must be complied with before an APD may be approved. Following BLM approval of an APD, a lessee may produce oil and gas from a lease well in a manner approved by BLM in the applicable APD or in subsequent sundry notices to the APD. The operator must notify the appropriate authorized officer for BLM, 48 hours before starting any surface disturbing activity approved in an APD.

The BLM received nominations (EOIs) for four parcels of public land administered by the St. George Field Office to be leased for oil and gas development (see Appendix A, Oil and Gas Lease Sale List; Appendix B, Map of Parcels). After an initial review of the nominated parcels, one parcel (UT0517-045) was recommended to be deferred from the June 2017 lease sale for various reasons (see rationale in Appendix C – Deferred Parcel List). The parcel may be

analyzed again in future years to be leased, if warranted. This EA has been prepared to disclose and analyze the potential environmental consequences of offering for sale at the June 2017 oil and gas lease sale, and the subsequent issuance of oil and gas lease, for three oil and gas lease parcels. The mineral rights for these parcels are owned by the federal government and administered by the SGFO. This EA is being used to determine the necessary administrative actions, stipulations, lease notices, special conditions, or restrictions that would be made a part of an actual lease at the time of issuance. Under all alternatives, continued interdisciplinary support and consideration would be required to ensure on-the-ground implementation of planning objectives, including the proper implementation of stipulations, lease notices and Best Management Practices (BMPs) through the APD process.

### **1.3 Purpose and Need for the Proposed Action**

Oil and gas production is an identified use of the public lands, as stated in sections 102(a)(12) and 103(e)(1) of the Federal Land Policy and Management Act of 1976 (FLPMA), and this use is conducted to meet requirements of the Mineral Leasing Act of 1920, as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act).

The purpose of the proposed action is to provide parcels for inclusion at a competitive oil and gas lease sale to be held by the BLM USO in June 2017. Pursuant to the Mineral Leasing Act of 1920, as amended, BLM Utah must hold competitive oil and gas lease sales, at least quarterly, when lands that are available for oil and gas leasing have been nominated. Moreover, BLM is required by law to review areas that have been nominated for potential inclusion at a competitive oil and gas lease sale.

The parcels proposed for offering for lease at the June 2017 oil and gas lease sale were nominated by the public. Thus, the proposed action and the June 2017 oil and gas lease sale are needed to respond to the public's oil and gas leasing nomination requests and, in doing so, ensure that BLM upholds the various statutorily imposed responsibilities it has been entrusted with.

### **1.4 Conformance with BLM Land Use Plan**

The alternatives described below are in conformance with the SGFO RMP, as maintained (BLM 1999) because they are specifically provided for in the planning decision. They conform to the following management decisions (RMP 2.7):

MI-01. Designate 239,059 acres open to leasing subject to Standard Stipulations (Category 1), 186,255 acres open to leasing with Special Stipulations (Category 2), 176,895 acres open to fluid mineral leasing subject to No Surface Occupancy (NSO) Stipulations (Category 3), and 26,828 acres closed (Category 4) to fluid mineral leasing.

## **1.5 Relationship to Statutes, Regulations, or Other Plans**

The proposed action is in compliance with federal environmental laws and regulations, Executive Orders, and Department of Interior and BLM policies and is consistent, to the maximum extent possible, with state laws and local and county ordinances and plans, including the following:

- Federal Land Policy and Management Act (1976) as amended and the associated regulations at 43 CFR Part 1600
- Mineral Leasing Act (1920) as amended and the associated regulations at 43 CFR Part 3100
- National Environmental Policy Act (1969) and the associated CEQ regulations at 40 CFR Parts 1500 through 1508
- Taylor Grazing Act (1934) as amended
- Utah Standards and Guidelines for Rangeland Health (1997)
- National Historic Preservation Act (1966) as amended and the associated regulations at 36 CFR Part 800 May 2016 Oil and Gas Lease Sale 5
- Endangered Species Act (1973) as amended
- BLM Manual 6840- Special Status Species Management
- Bald and Golden Eagle Protection Act (1962)
- Migratory Bird Treaty Act (1918)
- Utah Partners in Flight Avian Conservation Strategy Version 2.0 (Parrish et al., 2002)
- Birds of Conservation Concern 2002 (USFWS 2008)
- Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds



- MOU between the USDI BLM and USFWS to Promote the Conservation and Management of Migratory Birds (4/2010)
- BLM Manual 6310 - Conducting Wilderness Characteristics Inventory of BLM Lands
- Utah BLM Instructional memorandum 2016-027 – Bureau of Land Management (BLM) Utah Lands with Wilderness Characteristics Guidance.
- Determining Conformity of Federal Actions to State or Federal Implementation Plans (40 CFR Part 93 Subpart E)
- MOU among the USDA, USDI and EPA Regarding Air Quality Analysis and Mitigation for Federal Oil and Gas Decisions through the NEPA Process (2011)

All three parcels identified in this EA are located within Category 2, open to leasing with special stipulations. A lessee shall have the right to use as much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resources in leasehold subject to: “Stipulations attached to the lease; restrictions deriving from specific, non-discretionary statutes; and such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations.” Compliance with valid, nondiscretionary statutes (laws) is included in the standard lease terms and would apply to all lands and operations that are part of all of the alternatives.

Nondiscretionary actions include the BLM’s requirements under federal environmental protection laws, such as the Clean Water Act, Clean Air Act, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and FLPMA, which are applicable to all actions on federal lands even though they are not reflected in the oil and gas stipulations in the RMP and would be applied to all potential leases regardless of their category. Also included in all leases are mandatory stipulations for the statutory protection of cultural resources (BLM WO IM 2005-03, Cultural Resources and Tribal Consultation for Fluid Minerals Leasing) and threatened or endangered species (BLM WO IM-2002-174, Endangered Species Act Section 7 Consultation).

These documents, and their associated analysis or information, are hereby incorporated by reference, based on their use and consideration by various authors of this document. The attached Interdisciplinary Team Checklist, Appendix D, was also developed after consideration of these documents and their contents. Each of these documents is available for review upon request to the SGFO. Utah’s Standards for Rangeland Health address upland soils, riparian/wetlands, desired and native species and water quality. These resources are either analyzed later in this document or, if not impacted, are also listed in Appendix D.

## **1.6 Identification of Issues**

The proposed action was reviewed by an interdisciplinary parcel review team (IDPR) composed of resource specialists from the SGFO and Utah BLM State Office. This team identified resources in the June 2017 Oil and Gas Lease Sale parcel areas which might be affected and considered potential impacts using personal knowledge, the most current office records and applicable technical or scientific data for a particular resource or area, geographic information system (GIS) data, and site visits to the proposed lease parcels. The BLM USO specialists for air quality, wildlife, recreation, cultural resources, special designations, visual resources and solid minerals also reviewed this proposal.

On September 22, 2016, the IDPR team conducted site visits to the proposed parcels to validate existing knowledge and data and gather new information (if present) in order to make informed recommendations for the June 2017 oil and gas lease sale. Accordingly, one parcel is not included in the proposed action, and leasing stipulations were identified for those that were. A representative from the U.S. Forest Service, Pine Valley Ranger District also participated in the site visits with the SGFO IDPR team. The results of the IDPR team review are contained in the Interdisciplinary Team Checklist, Appendix D.

On August 23, 2016, the USO sent letters (or a memorandum) to the National Park Service (NPS), United States Fish and Wildlife Service (USFWS), USFS, and the State of Utah's Public Lands Policy Coordination Office (PLPCO), Utah Division of Wildlife Resources (UDWR) and the State Institutional Trust Lands Administration (SITLA) to notify them of the pending lease sale, solicit comments and concerns on the preliminary parcel list and invite agency representatives to participate in site visits to the proposed parcels.

Public notification was initiated by entering the project information on the BLM eplanning website on November 17, 2016. The EA and unsigned FONSI were posted for public review and comment from January 11, 2017 through February 10, 2017. Additional information for the public is maintained on the Utah BLM Oil and Gas Leasing Webpage. Additional information on public participation is available in Section 5.3.

## **1.7 Summary**

This chapter has presented the purpose and need of the proposed project, as well as the process for identifying issues and resources that could be affected by the implementation of the proposed project. In order to meet the purpose and need of the proposed project in a way that resolves the issues, the BLM has considered and/or developed a range of alternatives. These alternatives are presented in Chapter 2. The potentially affected environment will be described in Chapter 3. The potential environmental impacts or consequences that could result from the implementation of each alternative are analyzed in Chapter 4 and Appendix D.

## **2.0 DESCRIPTION OF ALTERNATIVES, INCLUDING THE PROPOSED ACTION**

### **2.1 Introduction**

This environmental assessment focuses on the Proposed Action and No Action alternatives. Other alternatives were considered, but ultimately not analyzed in detail because the issues identified during scoping did not indicate a need for additional alternatives or mitigation beyond those contained in the Proposed Action and No Action alternatives. The No Action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the Proposed Action.

### **2.2 Alternative A – Proposed Action**

Three parcels within the jurisdiction of the SGFO have been proposed for sale in the June 2017 oil and gas lease sale to be held by the BLM USO. The three proposed parcels containing 4,730.14 acres would be offered for lease, with resource protection measures (lease stipulations) consistent with the SGFO RMP (BLM, 1999). Legal descriptions of each parcel can be found in Appendix A, and a map of the proposed parcels can be found in Appendix B. All of the acreage proposed to be leased has been identified as being either open to leasing subject to standard lease stipulations or open to leasing subject to special stipulations, such as seasonal restrictions.

Leasing is an administrative action that affects economic conditions (payment of leasing fees to the government) but does not directly cause environmental consequences. However, leasing is considered to be an irretrievable commitment of resources because the BLM generally cannot deny all surface use of a lease unless the lease is issued with a NSO stipulation. Potential oil and gas exploration and production activities, committed to in a lease sale, could impact other resources and uses in the planning area. Direct, indirect, or cumulative effects to resources and uses could result from as yet undetermined and uncertain future levels of lease exploration or development.

Although at this time it is unknown when, where, or if future well sites or roads might be proposed on any leased parcel, should a lease be issued, site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD ). For the purposes of this analysis, and because the 1999 SGFO RMP did not address Reasonable Foreseeable Development Scenarios associated with Oil and Gas Leasing, this EA will utilize the Reasonably Foreseeable Development Scenario identified in the Richfield 2008 RMP (Appendix 12 of the RFO RMP/ROD). The BLM will assume that one well pad with access road will be constructed on each lease parcel subject to the terms, conditions, and stipulations of the lease. This will imply that over the next 10 years (the life of a lease that is not held by production), four locations could be drilled, with the potential surface disturbance of approximately 48 acres

(assuming approximately 12 acres per drill pad and access road). In general, activities are anticipated to take place as described in the following sections.

Standard lease terms would be attached to all issued leases. These terms provide for reasonable measures to minimize adverse impacts to specific resource values, land uses, or users (the standard lease terms are contained in Form 3100-11, Offer to Lease and Lease for Oil and Gas, U.S. Department of the Interior, BLM, October (2008). Once the lease has been issued, the lessee has the right to use as much of the leased land as necessary to explore for, drill for, extract, remove, and dispose of oil and gas deposits located under the leased lands subject to the standard lease terms and the lease stipulations attached to the lease; however, operations must be conducted in a manner that avoids unnecessary or undue degradation of the environment and minimizes adverse impacts to the land, air, water, cultural, biological, and visual elements of the environment, as well as other land uses or users.

Requirements for compliance with federal laws and regulations are included in the standard lease terms and would apply to all lands and operations that are part of the proposed action. These include BLM's requirements under federal environmental protection laws, such as the Clean Water Act, Clean Air Act, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and Federal Land Policy and Management Act (FLPMA), which are applicable to all actions on federal lands and would be applied to all potential leases regardless of their category.

All leases would include the lease stipulation for the protection of cultural resources, which states:

*"This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated."*(BLM Handbook 3120-1 Competitive Leases (P) p.35)

All leases issued would also include the lease stipulation for the protection of threatened or endangered species, which states:

*"The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its*

*conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the ESA as amended, 16 United States Code (USC) 1531 et seq. including completion of any required procedure for conference or consultation.”(BLM Handbook 3120-1 Competitive Leases (P) p.35)*

In addition, BLM regulations at 43 CFR 3101.1-2 allow, at a minimum, for the relocation of proposed oil and gas leasing operations up to 200 meters and/or timing limitations up to 60 days to provide additional protection to ensure that proposed operations minimize adverse impacts to resources, uses, and users.

## **2.2.1 Development Scenario for Analysis of Indirect and Cumulative Impacts**

### **Well Pad and Road Construction**

Equipment for well pad construction would consist of dozers, trackhoes, and graders. All well pads would be reclaimed. Topsoil from each well pad would be stripped to a minimum depth of six inches and stockpiled for future reclamation. Interim reclamation of the pad would occur if the well produces commercial quantities of oil or gas. Interim reclamation involves a reduction of the drill pad to a size that accommodates the functions of a producing well. The topsoil would be spread over the interim reclamation area, seeded, left in place for the life of the well, and then used during the final reclamation process. If the well is not productive final reclamation of the pad and constructed road would begin. Disturbance for each well pad would be estimated at an area of approximately four acres of land, including topsoil piles. Disturbed land would be seeded with a mixture (certified weed free) and at a rate, as recommended or required by the BLM.

Depending on the locations of the proposed wells, it is anticipated that some new or upgraded access roads would be required to access well pads and maintain production facilities. Any new roads constructed for the purposes of oil and gas development would be utilized year-round for maintenance of the proposed wells and other facilities, and for the transportation of fluids and/or equipment, and would remain open to other land users. Construction of new roads or upgrades to existing roads would require a 12-24 foot travelway width and would be constructed of natural materials. It is not possible to determine the distance of road that would be required because the location of the wells would not be known until the APD stage. However, for purposes of analyses it is assumed that disturbance from access roads would be approximately 8 acres (2 miles of road at 4 acres per mile) per well site.

## **Production Operations**

If wells were to go into production, facilities would be located at the well pad and typically include a well head, a dehydrator/separator unit, and storage tanks for produced fluids. The production facility would typically consist of two storage tanks, a truck load-out, separator, and dehydrator facilities. Construction of the production facility would be located on the well pad and not result in any additional surface disturbance.

All permanent surface structures would be painted a flat, non-reflective color specified by the BLM in order to blend with the colors of the surrounding natural environment. Facilities that are required to comply with the Occupational Safety and Health Act (OSHA) would be excluded from painting color requirements. All surface facilities would be painted immediately after installation and under the direction and approval of the BLM.

All operations would be conducted following the “Gold Book”, *Surface Operating Standards for Oil and Gas Exploration and Development*. The Gold Book was developed to assist operators by providing information on the requirements for conducting environmentally responsible oil and gas operations on federal lands. The Gold Book provides operators with a combination of guidance and standards for ensuring compliance with agency policies and operating requirements, such as those found at 43 CFR 3000 and 36 CFR 228 Subpart E; Onshore Oil and Gas Orders (Onshore Orders); and Notices to Lessees. Included in the Gold Book are environmental BMPs; these measures are designed to provide for safe and efficient operations while minimizing undesirable impacts to the environment.

If oil is produced, the oil would be stored on location in tanks and transported by truck to a refinery. The volume of tanker truck traffic for oil production would be dependent upon production of the wells.

## **Produced Water Handling**

Water is often associated with either produced oil or natural gas. Water is separated out of the production stream and can be temporarily stored in the reserve pit for 90 days. Permanent disposal options include discharge to evaporation pits or underground injection. Handling of produced water is addressed in Onshore Oil and Gas Order No. 7.

## **Maintenance Operations**

Traffic volumes during production would be dependent upon whether the wells produced natural gas and/or oil, and for the latter, the volume of oil produced. Well maintenance operations may include periodic use of work-over rigs and heavy trucks for hauling equipment to the producing well, and would include inspections of the well by a pumper on a regular basis or by remote

sensing. The road and the well pad would be maintained for reasonable access and working conditions. Portions of the well pad not needed for production of the proposed well, including the reserve pit, would be re-contoured and reclaimed, as an interim reclamation of the site.

### **Plugging and Abandonment**

If the wells do not produce economic quantities of oil or gas, or when it is no longer commercially productive, the well would be plugged and abandoned. The wells would be plugged and abandoned following procedures approved by a BLM Petroleum Engineer, which would include requiring cement plugs at strategic positions in the well bore. All fluids in the reserve pit would be allowed to dry prior to reclamation work. After fluids have evaporated from the reserve pit, sub-soil would be backfilled and compacted within 90 days. If the fluids within the reserve pit have not evaporated within 90 days (weather permitting or within one evaporation cycle, i.e. one summer), the fluid would be pumped from the pit and disposed of in accordance with applicable regulations. The well pad would be re-contoured, and topsoil would be replaced, scarified, and seeded within 180 days of the plugging the well.

### **2.3 Alternative B – No Action**

Under the No Action alternative, none of the nominated parcels would be offered for sale.

### **2.4 Alternatives Considered but Eliminated from Further Analysis**

A total of four parcels were nominated and forwarded to the SGFO for review in the June 2017 Oil and Gas Lease Sale. An alternative was considered that included leasing of all these parcels. One parcel (UT0517-045) was recommended to be deferred from the lease sale for various reasons (see rationale in Appendix C – Deferred Parcel List).

## **3.0 AFFECTED ENVIRONMENT**

### **3.1 Introduction**

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the Interdisciplinary Team Checklist found in Appendix D. This chapter provides the baseline for comparison of impacts/consequences described in Chapter 4. Only those aspects of the affected environment that are potentially impacted are described in detail in Chapters 3 and 4 (see also Appendix D). Resources that are either not present or present, but not affected to a degree where detailed analysis in Chapters 3 and 4 is needed are addressed in Appendix D, Interdisciplinary Team Checklist, of this EA.

## **3.2 General Setting**

The proposed action would result in the leasing for oil and gas development of three parcels located on public lands in Washington County and administered by the St. George Field Office. See Appendix A for legal descriptions and Appendix B for a map of the parcels. Additional information is also contained in the Interdisciplinary Team Checklist (Appendix D).

These parcels range in size from 1242.40 to 1,920.00 acres, for a total of 4,730.14 acres. The parcels are located north, northeast of St. George, Utah (Appendix B – Parcel Map). The landscape, topography, plant and animal species throughout the proposed lease parcels are varied. Parcel # 044 is located just northeast of the town of Toquerville Utah, and is dissected by the I-15 Corridor. The parcel is general flat with rolling hills, except the west side which is bordered by the Hurricane Cliffs. The ash creek drainage dissects this parcel. The primary vegetation on this parcel is pinyon and juniper trees with a mixture of black brush and native grasses. Parcels 042 & 043 are located just north of the town of Virgin, along the Zion Corridor. Both parcels are dissected by the North Creek drainage, a perennial stream. The topography of these two parcels is a mixture of very steep slopes to flat rolling hills. The vegetation consists of black brush and sagebrush with a mixture of native grass and isolated pinyon and juniper trees.

## **3.3 Resources/Issues Brought Forward for Analysis**

### **3.3.1 Air Quality, Climate Change, and Greenhouse Gases**

These resources are interrelated and are being combined for discussion and analysis. Air quality is affected by various natural and anthropogenic factors. Industrial sources such as power plants, mines, and oil and gas extraction activities within Utah contribute to local and regional air pollution. Urbanization and tourism create emissions that affect air quality over a wide area. Air pollutants generated by motor vehicles include tailpipe emissions and dust from travel over dry, unpaved road surfaces. Strong winds can generate substantial amounts of windblown dust. Air pollution emissions are characterized as point, area, or mobile. Point sources are large, stationary facilities such as power plants and manufacturing facilities and are accounted for on a facility by facility basis. Area sources are smaller stationary sources and, due to their greater number, are accounted for by classes. Production emissions from an oil and gas well and dust from construction of a well pad would be considered area source emissions. Mobile sources consist of non-stationary sources such as cars and trucks. Mobile emissions are further divided into on-road and off-road sources. Engine exhaust from truck traffic to and from oil and gas locations would be considered on-road mobile emissions. Engine exhaust from drilling operations would be considered off road mobile emissions.

The Clean Air Act required the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and



the environment. The Utah Division of Air Quality (UDAQ) is responsible for ensuring compliance with the NAAQS within the state of Utah. Table 1 shows NAAQS for the EPA designated criteria pollutants (EPA 2008).

**Table 1. National Ambient Air Quality Standards (NAAQS) for the EPA designated criteria pollutants**

| Pollutant<br>[final rule cite]  |                   | Primary/<br>Secondary | Averaging<br>Time       | Level                      | Form  |
|---|-------------------|-----------------------|-------------------------|----------------------------|---|
| <a href="#">Carbon Monoxide</a><br>[76 FR 54294, Aug 31, 2011]                                |                   | primary               | 8-hour                  | 9 ppm                      | Not to be exceeded more than once per year                                    |
|   |                   |                       | 1-hour                  | 35 ppm                     |   |
| <a href="#">Lead</a><br>[73 FR 66964, Nov 12, 2008]   |                   | primary and secondary | Rolling 3 month average | 0.15 µg/m <sup>3</sup> (1) | Not to be exceeded  |
| <a href="#">Nitrogen Dioxide</a><br>[75 FR 6474, Feb 9, 2010]<br>[61 FR 52852, Oct 8, 1996]   |                   | primary               | 1-hour                  | 100 ppb                    | 98th percentile, averaged over 3 years  |
|   |                   | primary and secondary | Annual                  | 53 ppb (2)                 | Annual Mean   |
| <a href="#">Ozone</a><br>[73 FR 16436, Mar 27, 2008]  |                   | primary and secondary | 8-hour                  | 0.075 ppm (3)              | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| <a href="#">Particle Pollution</a><br>[71 FR 61144, Oct 17, 2006]                             | PM <sub>2.5</sub> | primary and secondary | Annual                  | 15 µg/m <sup>3</sup>       | annual mean, averaged over 3 years  |
|   |                   |                       | 24-hour                 | 35 µg/m <sup>3</sup>       | 98th percentile, averaged over 3 years  |
|   | PM <sub>10</sub>  | primary and secondary | 24-hour                 | 150 µg/m <sup>3</sup>      | Not to be exceeded more than once per year on average over 3 years            |
| <a href="#">Sulfur Dioxide</a><br>[75 FR 35520, Jun 22, 2010]<br>[38 FR 25678, Sept 14, 1973] |                   | primary               | 1-hour                  | 75 ppb (4)                 | 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
|   |                   | secondary             | 3-hour                  | 0.5 ppm                    | Not to be exceeded more than once per year                                    |

as of October 2011

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m<sup>3</sup> as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO<sub>2</sub> standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard (“anti-backsliding”). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO<sub>2</sub> standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

## Prevention of Significant Deterioration

Under the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act (CAA), incremental increases of specific pollutant concentrations are limited above a legally defined

baseline level. Many national parks and wilderness areas are designated as PSD Class I. The PSD program protects air quality within Class I areas by allowing only slight incremental increases in pollutant concentrations. Areas of Utah not designated as PSD Class I are classified as Class II. For Class II areas, greater incremental increases in ambient pollutant concentrations are allowed as a result of controlled growth.

### **Air Quality Related Values**

Air Quality Related Values (AQRVs) are resources applied to all PSD Class I and sensitive Class II areas that may be affected by changes in air quality. AQRVs include visibility, dark night skies, vegetation, wildlife, and soils. Visibility is the most sensitive AQRV in the parks. Visibility is impaired by haze caused by tiny particles that scatter and absorb light. Sulfates, crustal materials, organic carbon, elemental carbon, and nitrates, in order of decreasing contributions, comprise particles that result in the formation of haze in the western U.S. Sulfates and crustal materials are responsible for over 50 percent of the causes of visibility impairment. Sulfate particles are formed from sulfur dioxide gas released from coal-burning power plants and other industrial sources. Crustal materials are windborne dust particles from dirt roads and other open spaces. The EPA's Regional Haze regulations required states to establish goals for each Class I air quality area to improve visibility on the haziest days and ensure no degradation occurs on the clearest days. The 2008 Government Performance and Results Act (GPRA) set goals for air quality for parks including Zion National Park located approximately one mile south and west of parcels UT0517-042 and UT0517-043 and 12-15 miles west of the other two parcels. While an AQRV reflects a land management agency's policy and is not a legally enforceable standard, federal regulations such as the EPA's Regional Haze rule and GPRA ensure the protection of some AQRVs.

Zion National Park was designated a Class I air quality area in 1977, receiving the highest protection under the Clean Air Act. Both local and distant air pollutant sources affect air quality in Zion NP. Nearby large point sources include power plants, refineries, and lime kilns in Coconino County, Arizona, and Clark County, Nevada. Pollutants also travel greater distances to the park from both mobile and point sources throughout the Southwest (NPS-ARD 2006e). The AQRVs of Zion NP are those resources that are potentially sensitive to air pollution, including vegetation, wildlife, water quality, soils, visibility, and night skies. At present, visibility has been identified as the most sensitive AQRV in the park; other AQRVs may also be sensitive, but have not been sufficiently studied. Although visibility in the park is still superior to that in many parts of the country, it is only rated as being in moderate condition, and is often impaired by light-scattering pollutants (haze).

Ozone has been monitored in ZION since 2003. Ozone can be a respiratory irritant, causing coughing, sinus inflammation, chest pains, scratchy throat, lung damage, and reduced immune system functions. Children, the elderly, people with existing health problems, and active adults

are most vulnerable. Human health risk from ground-level ozone warrants moderate concern. This condition is based on NPS Air Resource Division benchmarks and the 2008–2012 estimated ozone of 71.5 parts per billion (ppb) (NPS-ARD 2015).

For 2003–2012, the trend in ozone concentration at ZION remained relatively unchanged (no statistically significant trend)

**Table 2: Air Quality and AQRV Trends in Nearby Zion National Park**

| National Park | Visibility                   | Nitrogen Deposition | Sulfur Deposition | Ozone                            |
|---------------|------------------------------|---------------------|-------------------|----------------------------------|
| Zion          | Moderate Condition, No Trend | No Data             | No Data           | Moderate Condition, Trend Static |

Source: NPS, 2003-2012

### **Hazardous Air Pollutants**

Hazardous air pollutants (HAPs) are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental impacts. The EPA has classified 187 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethylbenzene, isomers of xylene (BTEX) compounds, and normal-hexane (n-hexane).

The CAA requires the EPA to regulate emissions of toxic air pollutants from a published list of industrial sources referred to as “source categories.” The EPA has developed a list of source categories that must meet control technology requirements for these toxic air pollutants. Under Section 112(d) of the CAA, the EPA is required to develop regulations establishing national emission standards for hazardous air pollutants (NESHAP) for all industries that emit one or more of the pollutants in major source quantities. These standards are established to reflect the maximum degree of reduction in HAP emissions through application of maximum achievable control technology (MACT). Source categories for which MACT standards have been implemented include oil and natural gas production and natural gas transmission and storage.

### **Greenhouse Gases (GHGs) and Climate Change**

“Climate change” refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. “Global warming” refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change. Climate is both a driving force and limiting

factor for ecological, biological, and hydrological processes, and has great potential to influence resource management.

As explained in CEQ's recent guidance on the consideration of GHG emissions and climate change in NEPA review, climate change science continues to expand and refine our understanding of the impacts of anthropogenic GHG emissions (CEQ, 2016). CEQ's first Annual Report in 1970 referenced climate change, indicating that "[m]an may be changing his weather." It is now well established that rising global atmospheric GHG emission concentrations are significantly affecting the Earth's climate. These conclusions are built upon a scientific record that has been created with substantial contributions from the United States Global Change Research Program (USGCRP).<sup>1</sup> Studies have projected the effects of increasing GHGs on many resources normally discussed in the NEPA process, including water availability, ocean acidity, sea-level rise, ecosystem functions, energy production, agriculture and food security, air quality and human health.

Based primarily on the scientific assessments of the USGCRP, the National Research Council, and the Intergovernmental Panel on Climate Change, in 2009 the Environmental Protection Agency (EPA) issued a finding that the changes in our climate caused by elevated concentrations of greenhouse gases in the atmosphere are reasonably anticipated to endanger the public health and public welfare of current and future generations. In 2015, EPA acknowledged more recent scientific assessments that "highlight the urgency of addressing the rising concentration of CO<sub>2</sub> in the atmosphere," finding that certain groups are especially vulnerable to climate-related effects. Broadly stated, the effects of climate change observed to date and projected to occur in the future include more frequent and intense heat waves, longer fire seasons and more severe wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea-level rise, more intense storms, harm to water resources, harm to agriculture, ocean acidification, and harm to wildlife and ecosystems.

Consistent with CEQ's guidance, this EA includes a qualitative and quantitative analysis of possible greenhouse gas emissions that could occur as a result of reasonably foreseeable oil and gas development associated with the parcels being offered for lease. Additional information about potential emissions would also be available and calculated as part of subsequent site-specific reviews at the APD stage.

It is accepted within the scientific community that global temperatures have risen at an increased rate and the likely cause is gases that trap heat in the atmosphere, referred to as greenhouse gases (GHG). GHGs are composed mostly of carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), water vapor, and ozone. The greenhouse gas effect is the process in which the radiation

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<sup>1</sup> See Global Change Research Act of 1990, Pub. L. 101-606, Sec. 103 (November 16, 1990). For additional information on the United States Global Change Research Program [hereinafter "USGCRP"], visit <http://www.globalchange.gov>.

from the sun that heats the surface of Earth gets blocked by GHG molecules in Earth's atmosphere. Since GHGs are composed of molecules that absorb and emit infrared electromagnetic radiation (heat), they form an intrinsic part of the greenhouse effect.

Greenhouse gases are often presented using the unit of Metric Tons of CO<sub>2</sub> equivalent (MT CO<sub>2</sub>e) or Million Metric Tons (MMT CO<sub>2</sub>e), a metric to express the impact of each different greenhouse gas in terms of the amount of CO<sub>2</sub> making it possible to express greenhouse gases as a single number. For example, 1 ton of methane would be equal to 25 tons of CO<sub>2</sub> equivalent, because it has a global warming potential (GWP) 25 times that of CO<sub>2</sub> (The Guardian, 2011).

As defined by USEPA, the GWP provides “ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of CO<sub>2</sub>.” The GWP of greenhouse gas is used to compare global impacts of different gases and used specifically to measure how much energy the emissions of one ton of gas will absorb over a given period of time (e.g. 100 years), relative to the emissions of one ton of CO<sub>2</sub>. The GWP accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere. The GWP provides a method to quantify the cumulative effects of multiple GHGs released into the atmosphere by calculating carbon dioxide equivalent for the GHGs.

- Carbon dioxide (CO<sub>2</sub>), by definition, has a GWP of 1 regardless of the time period used because it is the gas being used as the reference. CO<sub>2</sub> remains in the climate system for a very long time; CO<sub>2</sub> emissions cause increases in the atmospheric concentrations of CO<sub>2</sub> that will last thousands of years (USEPA, 2016h).
- Methane (CH<sub>4</sub>) is estimated to have a GWP of 28-36 times that of CO<sub>2</sub> over 100 years. CH<sub>4</sub> emitted today lasts about a decade on average, which is much less time than CO<sub>2</sub>. But CH<sub>4</sub> also absorbs much more energy than CO<sub>2</sub>. The net effect of the shorter lifetime and higher energy absorption is reflected in the GWP. The methane GWP also accounts for some indirect effects, such as the fact that methane is a precursor to ozone, and ozone is in itself a greenhouse gas (USEPA, 2016h).
- Nitrous Oxide (N<sub>2</sub>O) has a GWP of 265-298 times that of CO<sub>2</sub> for a 100-year timescale. N<sub>2</sub>O emitted today remains in the atmosphere for more than 100 years, on average (USEPA, 2016h). Table 3.3. contains GHGs regulated by USEPA and global warming potentials.

**Table. 3: GHG Regulated by USEPA and Global Warming Potentials**

| Air Pollutant  | Chemical Symbol/<br>Acronym | Global Warming<br>Potential |
|----------------|-----------------------------|-----------------------------|
| Carbon Dioxide | CO <sub>2</sub>             | 1                           |

|                     |                  |        |
|---------------------|------------------|--------|
| Methane             | CH <sub>4</sub>  | 25     |
| Nitrous Oxide       | N <sub>2</sub> O | 298    |
| Hydrofluorocarbons  | HFCs             | Varies |
| Perfluorocarbons    | PFCs             | Varies |
| Sulfur hexafluoride | SF <sub>6</sub>  | 22,800 |

Source: (USEPA, 2016h)

The IPCC (2007) concluded that “warming of the climate system is unequivocal” and “most of the observed increase in global average temperatures since the mid-20<sup>th</sup> century is very likely due to the observed increase in anthropogenic GHG concentrations.” Extensive research and development efforts are underway in the field of carbon capture and sequestration (CCS) technology, which could help direct management strategies in the future. The IPCC has identified a target worldwide “carbon budget” to estimate the amount of CO<sub>2</sub> the world can emit while still having a likely chance of limiting global temperature rise to 2°C above pre-industrial levels. The international community estimates this budget to be 1 trillion tons of carbon (IPCC, 2016).

Because GHGs circulate freely throughout Earth’s atmosphere, climate change is a global issue. The largest component of global anthropogenic GHG emissions is CO<sub>2</sub>. Global anthropogenic carbon emissions reached about 7,000,000,000 MT per year in 2000 and an estimated 9,170,000,000 MT per year in 2010 (Boden, Marland, & Andres, 2013). Oil and gas production contributes to GHGs such as CO<sub>2</sub> and methane. Natural gas systems were the largest anthropogenic source category of CH<sub>4</sub> emissions in the United States in 2014 with 176.1 MMT CO<sub>2</sub> e of CH<sub>4</sub> emitted into the atmosphere. Those emissions have decreased by 30.6 MMT CO<sub>2</sub> e (14.8 percent) since 1990 (USEPA, 2016).

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (National Aeronautics and Space Administration Goddard Institute for Space Studies, 2007). In 2001, the IPCC (2007) indicated that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (Hansen et al., 2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Data indicate that northern latitudes (above 24° N) have exhibited temperature increases of nearly 1.2°C (2.1°F) since 1900, with nearly a 1.0°C (1.8°F) increase since 1970 alone. It also shows temperature and precipitation trends for the conterminous United States. For both parameters we see varying rates of change, but overall increases in both temperature and precipitation.

### **3.3.2 Cultural Resources**

The National Historic Preservation Act (NHPA) requires that federal agencies take into account the effects of their undertakings on sites that are eligible for the National Register of Historic Places (NRHP).

A literature review was completed using electronic records archived at the SGFO, the CURES data maintained by the Utah Division of State History, and General Land Office maps maintained by the BLM. Using ArcGIS 10, BLM combined digital cultural data from these multiple sources and analyzed the sites and projects located within and near the three parcels. The purpose of the review was to document and characterize the previously completed surveys and previously documented cultural resource sites within and surrounding the three lease parcels.

The literature review indicated that parcels UT-0517-042 and UT-0517-043 will have low site densities (less than one site per 100-acres or greater). Four sites have been identified in parcel UT-0517-042, two of these have been determined to be eligible for the NRHP. Four sites have been identified in parcel UT-0517-043 and one of these was determined eligible for the NRHP. All but one of the sites identified in parcels UT-0517-042 and 042 were historic period sites. Any additional unidentified sites would be expected to be predominately historic and associated with ranching and farming efforts, and early 20th century oil extraction in the Virgin Oil Field. Prehistoric sites are likely to be Virgin Ancestral Pueblo sites dating to the Formative Period (ca. 700 B.C.-1250 A.D.) located within the close proximity North Creek.

The site density at UT-0517-044 is expected to be higher relative to the other parcels, but would be characterized as moderate for the Washington County area. Extrapolation using survey data from within and surrounding the parcel would suggest a site density of approximately 1 site per 14 acres. Eighteen sites have been identified in this parcel. Eight are historic era sites and the remaining ten are prehistoric artifact scatters. Four of these sites have been determined eligible for the NRHP. Both historic and prehistoric sites are expected to be located in this parcel. Historic sites are expected to be small or linear, and associated with transportation, silver mining from the Silver Reef District located to the south, homesteading and farming. Prehistoric sites are expected to be small artifact scatters and most frequent in closer proximity to Ash Creek.

### **3.3.3 Lands with Wilderness Characteristics**

Lands with wilderness characteristics are areas of at least 5,000 acres in a natural or undisturbed condition that also provide outstanding opportunities for solitude and/or primitive forms of recreation. Lands with wilderness characteristics are a resource of public lands that is periodically inventoried under Section 201 of the Federal Lands Policy Management Act (FLPMA). The management of lands with wilderness characteristics is determined through the land use planning process.

In 2012 and 2013 the BLM St. George Field Office (SGFO) conducted a field office-wide wilderness characteristics inventory in support of the Resource Management Plans for the Red

Cliffs and Beaver Dam Wash National Conservation Areas, the St. George Field Office Resource Management Plan Amendment, and the Comprehensive Travel Management Plan. The inventory was conducted according to guidance in BLM Manual 6310, *Conducting Wilderness Characteristics Inventory on BLM Lands*. Due to the targeted scope of the St. George Field Office Resource Management Plan Amendment, these lands have not yet been evaluated through a land use planning process.

BLM identified approximately 9,512 acres of wilderness characteristics in the Smith Mesa unit (UT-040-141), which is located in Washington County, northeast of Virgin, Utah.

One of the lease parcels, UT-0517-042, overlaps 592 acres (~6.2%) of the Smith Mesa unit (UT-040-141). Less than 5 acres (<0.05%) of the Smith Mesa unit are within lease parcel UT-0517-043.

A detailed description of the inventory conducted in these sub-units is documented using standard forms from BLM Manual 6310. That inventory can be found in Appendix F.

#### Inventory Unit UT-040-141A

UT-040-141A is an inventory sub-unit of the larger Smith Mesa UT-040-141 inventory unit, which meets the criteria for size as defined in Section 2(c) of the Wilderness Act incorporated in the Federal Land Policy Management Act of 1976. The overall acreage of unit 141 is 11,968 acres, fulfilling the requirement of sufficient size as to make practicable its preservation and use in an unimpaired condition. Sub-unit 141A makes up 2,729.93 acres of the total acreage of Unit 141. All lands within Sub-Unit 141A are managed by the Bureau of Land Management St. George Field Office. The parcel is located in Washington County, northeast of Virgin, Utah.

The inventory determined that 393 acres of UT-040-141A that overlaps proposed lease parcel UT-0517-042 contains wilderness characteristics. The results are shown on Map in Appendix E, and the details of the inventory can be found in Appendix F.

#### Inventory Unit UT-040-141B

UT-040-141B is an inventory sub-unit of the larger Smith Mesa UT-040-141 inventory unit, which meets the criteria for size as defined in Section 2(c) of the Wilderness Act incorporated in the Federal Land Policy Management Act of 1976. The overall acreage of unit 141 is 11,968 acres, fulfilling the requirement of sufficient size as to make practicable its preservation and use in an unimpaired condition. Sub-unit 141B makes up 4746.17 acres of the total acreage of Unit 141. All lands within section 141B are managed by the Bureau of Land Management St. George Field Office. The parcel is located in Washington County, northeast of Virgin, Utah.

The inventory determined that 199 acres of UT-040-141B that overlaps proposed lease parcel UT-0517-042 contains wilderness characteristics. The results are shown on Map in Appendix E and the details of the inventory can be found in Appendix F.

### **3.3.4 Migratory Birds**



For a list of birds protected by the Migratory Bird Treaty Act, see Appendix E, and a list of Birds of Conservation Concern (USFWS 2008) occurring in Washington County, Utah, see Appendix F.

### **3.3.5 Recreation**

All of the proposed lease parcels are used for dispersed recreation activities, primarily hiking, hunting, and other human-powered pursuits. The Flying Monkey mountain bike trail is located within lease parcels UT-0517-042 and UT-0517-043.

### **3.3.6 Socio-Economics**

Washington County's population totaled 144,809 in 2012, with the City of St. George accounting for 52.2% of this total. Population growth has far outpaced that of Utah and the United States as a whole, although the County's population growth has slowed somewhat recently compared to previous decades. The population is 93.9% white, which is slightly higher than the state-wide percentage. Over 18% of the population is aged 65 or older, which is twice the percentage for all other counties in the state, and appears to reflect the popularity of greater St. George area as a retirement destination. Approximately 91% of the population age 25 and over have a high school education or higher, with over 25% of the population holding an undergraduate degree or higher.

As of 2012, annual per capita personal income in Washington County was \$28,597, which is lower than the statewide estimate of \$35,430. Of the Washington County total, approximately \$13,976 (48.9%) represents non-labor income, which is considerably higher than the State of Utah or U.S. national average. This may reflect the significantly higher percentage of older and retired residents who live in the County. Unemployment averaged 7% for 2012, although the seasonally adjusted rate had dropped to 5.3% by October 2013. The percentage of the population living at or below the poverty level averaged 14.5% over the period between 2008 and 2012, somewhat higher than the state average of 12.1%.

### **3.3.7 Threatened, Endangered or Candidate Animal Species**

Four federally listed species were determined to have the potential to occur in the Project Area: California condor, Mexican spotted owl, Southwestern willow flycatcher and Western yellow-billed cuckoo.

#### **California condor**

The California condor was listed federally endangered on March 11, 1967 and noted to only occur in California (USFWS 1976). By 1987, the last wild condor was captured and taken to the

San Diego Wild Animal Park (USFWS 1996). Beginning with the first successful breeding of California condors in 1988, the population grew to 121 in 1996, including 104 in the captive flock, and 17 in the wild (USFWS 1996).

On October 16, 1996, the USFWS announced plans to reintroduce California condors into northern Arizona and designate these birds as non-essential experimental populations, as provided by Section 10j of the ESA (USFWS 1996). California condors from the experimental population area (USFWS 1996) frequently forage away from the Vermillion Cliffs of Arizona into southwestern Utah, including Washington County. Most California condor use occurs east of the project area near Zion National Park and no nests, roosts, or other special use areas for condors have been identified in the Project Area.

Under the requirements of NEPA, when a proposed action may potentially affect the California condor 10(j) non-essential experimental population, the 10(j) population should be addressed (and their status defined), and then not carried forward for further analysis within the NEPA document.

### **Mexican Spotted Owl**

The Mexican spotted owl (*Strix occidentalis lucida*) (MSO) was listed as threatened under the ESA on March 16, 1993 (58 FR 14248). The species listing was a result of declining population numbers attributed to habitat loss. Critical habitat was originally designated on June 6, 1995 (60 FR 29913), but was revoked and re-designated in 2001 (65 FR 8530). It was revoked again, and finally re-designated in 2004 (69 FR 53181). A recovery plan for the MSO was approved on October 16, 1995. The MSO ranges from British Columbia to Mexico along a corridor that includes western Utah and a portion of the project area. They nest in steep canyon areas in a variety of mixed forest types (Ehrlich et al. 1988). They will nest in trees, tree cavities, and cliff faces. MSOs do not build their own nests, but utilize nests that have been built by other bird species. Their diet consists mainly of rodents, but they will also eat rabbits, birds, lizards and other small vertebrates. They will brood up to four eggs, which will hatch in 28 to 32 days. The young are cared for by both parents, and are fledged in 34 to 36 days (Gutierrez 1995).

The three proposed Oil and Gas Parcels UT0517-042 (North Creek), UT0517-043 (Virgin Town), and UT0517-044 (Ash Creek) are located on the western border of MSO designated critical habitat. These parcels have sagebrush, black brush and other desert shrubs at their lower elevations, with mixed desert shrub and scattered pinyon and juniper trees at higher elevations. There is several large cliffs and talus slopes in these parcels, however, the lack of suitable nesting substrates (no walled canyons) and habitat structure (open and sparsely vegetated) associated with these sites does not provide suitable nesting habitat. There are no protected activity centers (PACs) near these parcels that would be impacted by future oil and gas development. No MSO or their sign have been observed in the past and no special use areas

have been identified. These parcels provide opportunities to MSO as foraging and dispersal habitat.

### **Southwestern willow Flycatcher**

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) (SWIFL) was listed federally endangered in 1995 (USFWS 1995a). Here in Washington County, the SWIFL received additional protection when critical habitat was designated along the Virgin River from Hurricane Bridge (Hwy 9) to the Utah/Arizona Stateline (USFWS 2013). A recovery plan for SWIFL was developed by USFWS, other federal and state agencies, and interest groups in 2002 (USFWS 2002). The SWIFL primarily breeds in the southwestern United States and winters in Central America and southern Mexico (USFWS 2002). In Utah, the SWIFL is found in the southern portion of the state in riparian habitats where dense growth of willows (*Salix* spp.), cottonwood (*Populus* spp.) and other riparian plants occur. The SWIFL eats insects, seeds, and berries. Breeding occurs during late spring or early summer, with peak breeding activity occurring in June. Large scale losses of southwestern wetlands have occurred, particularly the cottonwood-willow riparian habitats of the SWIFL from urban and agricultural development, water diversion, and impoundment, channelization, livestock grazing, off-road vehicle and other recreation uses, and hydrological changes resulting from these and other land uses (USFWS 1995a).

### **Western Yellow-billed Cuckoo**

The Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) (cuckoo) was listed as a threatened species (USFWS 2014) due to declining populations attributed to habitat loss, degradation and fragmentation. Cuckoos are considered a riparian obligate and are usually found in large tracts of dense cottonwood or willow habitats, below 33 ft. in height (UDWR 2010b). Population status and trends within Washington County are unknown, however, birds have been observed along the Virgin River and some tributaries. Cuckoo nesting behavior may be closely tied to food abundance. In years of low food abundance, cuckoos may forego nesting. Cuckoos are one of the latest migrants to arrive and breed in Utah. They arrive in late May or early June and breed in late June through July (Parrish et. al. 2002). Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within 300 feet of water (UDWR 2010b). Cuckoos typically start their southerly migration by late August or early September. Yellow-billed cuckoos feed almost entirely on large insects that they glean from tree and shrub foliage. They feed primarily on caterpillars, including tent caterpillars. They also feed frequently on grasshoppers, cicadas, beetles, and katydids, occasionally on lizards, frogs, and eggs of other birds, and rarely on berries and fruits (UDWR 2010b).

### **3.3.8 Visual Resources**

The BLM uses a Visual Resource Management (VRM) system to inventory and manage visual resources on public lands. The primary objective of VRM is to manage visual resources so that the quality of scenic (visual) values is protected appropriately for the relevant management class. The VRM system uses four management classes (and their associated visual resource objectives) to describe the different degrees of surface disturbance or modification allowed on the landscape.

#### VRM Class Objectives

Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low. VRM Class I areas are typically reserved for designated wilderness or other high quality landscapes where preservation is a high priority.

Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape

Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV: The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of the landscape.

The proposed lease parcels are within VRM Classes II and III.

#### Parcel UT0517-042

VRM II 1501 acres

VRM III: 100 acres

#### Parcel UT0517-043

VRM II: 1224

VRM III: 28

Parcel UT0517-044

VRM III: 1880 acres.

### **3.3.9 Wildlife Excluding USFWS Designated Species**

All three parcels proposed for lease are located in Crucial Mule Deer Winter Range as specified by Utah Division of Wildlife Resources. The SGFO RMP (1999, Page 2.24) specifies that crucial mile deer winter range will be protected from the potential effects of fluid mineral leasing with a Category 2 seasonal stipulation to close the land to exploration or development from November 1 to April 15.

The following BLM Sensitive species may occur in the project area: Arizona toad (permanent resident, fairly common), Great Plains toad (permanent resident, fairly common), bald eagle (winter visitor, fairly common), burrowing owl (permanent resident, uncommon), ferruginous hawk (permanent resident, fairly common), Lewis's woodpecker (permanent resident, rare), Northern goshawk (permanent resident, rare), short-eared owl (transient, rare), Allen's big-eared bat (permanent resident, extremely rare), big- free-tailed bat (summer resident, rare), fringed myotis (permanent resident, uncommon), kit fox (permanent resident, uncommon), spotted bat (permanent resident, rare), Townsend's big-eared bat (permanent resident, fairly common), Western red bat (permanent resident, extremely rare), desert sucker (permanent resident, fairly common), flannel-mouth sucker (permanent resident, fairly common), Virgin spinedace (permanent resident, fairly common), common chuckwalla (permanent resident, uncommon), gila monster (permanent resident, rare), sidewinder (permanent resident, fairly common), Western banded gecko (permanent resident, uncommon), Western threadsnake (permanent resident, rare) and zebra-tailed lizard (permanent resident, fairly common). Desert suckers, Virgin spinedace and flannel-mouth sucker all occur in North Creek and are fairly abundant. These three species occur also in Ash Creek, however, only desert sucker occurs in the upper reach on the Oil and Gas parcel and only during the spring when there are flows in the stream.

General wildlife found in the project area include: badgers, antelope ground squirrels, kangaroo rats, deer mice, desert wood rats, wild turkey, chukar, Gambel's quail, mourning doves, common ravens, wrens, house finches, side-blotched lizards, and Western whiptails. Infrequently, larger animals such as raptors, coyotes, gray fox, and mule deer may pass through the area.

Two out of the three proposed oil and gas parcels, UT0517-042 (North Creek) and UT0517-044 (Ash Creek), contain riparian habitat. In 1999, the St. George Resource Management Plan (BLM 1999) classified these parcels as "Open" to oil and gas leasing, with No Surface Occupancy

(NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development.

## **4.0 ENVIRONMENTAL IMPACTS**

### **4.1 Introduction**

This chapter discusses the environmental consequences of implementing the alternatives described in Chapter 2. Under NEPA, actions with the potential to affect the quality of the human environment must be disclosed and analyzed in terms of direct and indirect effects—whether beneficial or adverse and short or long term—as well as cumulative effects. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by an action but occur later or farther away from the resource. Beneficial effects are those that involve a positive change in the condition or appearance of a resource or a change that moves the resource toward a desired condition. Adverse effects involve a change that moves the resource away from a desired condition or detracts from its appearance or condition. Cumulative effects are the effects on the environment that result from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions.

The No Action alternative (offer none of the nominated parcels for sale), serves as a baseline against which to evaluate the environmental consequences of the Proposed Action alternative (offer four of the parcels for sale with additional resource protective measures). For each alternative, the environmental effects are analyzed for the resources that were carried forward for analysis in Chapter 3.

### **4.2 Direct and Indirect Impacts**

#### **4.2.1 Alternative A – Proposed Action**

This section analyzes the impacts of the proposed action to those potentially impacted resources described in the Affected Environment (Chapter 3).

##### **4.2.1.1 Air Quality, Climate Change, and Greenhouse Gases**

#### **Existing Sources of Pollution**

The Color County District (which includes Washington County) has existing sources of pollution that vary mainly from regional ozone to particulate matter. Regional ozone is typical in the western states as forest fires, transport from shipping lanes, electric power generation and a conglomerate of other sources combine under certain meteorological conditions. Particulate matter is another issue during dust storms or kicked up from other activities in this dry region.

**Table 1. Division of Air Quality – 2011 Annual Report Triennial Inventory (tons/year)**

| County     | CO        | NOx      | PM10      | PM2.5    | SOx   | VOC       |
|------------|-----------|----------|-----------|----------|-------|-----------|
| Washington | 39,317.60 | 6,026.07 | 11,644.41 | 1,697.22 | 91.64 | 44,442.68 |

The act of leasing would not result in changes to air quality. However, should the leases be issued, development of those leases could impact air quality conditions. It is not possible to accurately estimate potential air quality impacts by computer modeling from the project due to the variation in emission control technologies as well as construction, drilling, and production technologies applicable to oil versus gas production and utilized by various operators, so this discussion remains qualitative.

Prior to authorizing specific proposed projects on the subject lease parcels quantitative computer modeling using project specific emission factors and planned development parameters (including specific emission source locations) may be conducted to adequately analyze direct and indirect potential air quality impacts. In conducting subsequent project specific analysis BLM will follow the policy and procedures of the National Interagency MOU Regarding Air Quality Analysis and Mitigation for Federal Oil and Gas Decisions through NEPA, and the FLAG 2010 air quality guidance document. Air quality dispersion modeling which may be required includes impact analysis for demonstrating compliance with the NAAQS, plus analysis of impacts to Air Quality Related Values (i.e. deposition, visibility), particularly as they might affect regional Class 1 areas (national parks and wilderness areas).

An oil or gas well, including the act of drilling, is considered to be a minor source under the Clean Air Act. Minor sources are not controlled by regulatory agencies responsible for implementing the Clean Air Act. In addition, control technology is not required by regulatory agencies at this point, all of the parcels occur in NAAQS attainment areas. Different emission sources would result from the two site specific lease development phases: well development and well production. The BLM does look to mitigate pollutants via lease stipulations and further NEPA actions throughout the lease process.

Well development includes emissions from earth-moving equipment, vehicle traffic, drilling, and completion activities. NOX, SO<sub>2</sub>, and CO would be emitted from vehicle tailpipes. Fugitive dust concentrations would increase with additional vehicle traffic on unpaved roads and from wind erosion in areas of soil disturbance. Drill rig and fracturing engine operations would result mainly in NOX and CO emissions, with lesser amounts of SO<sub>2</sub>. These temporary emissions would be short-term during the drilling and completion times.

During well production there are continuous emissions from separators, condensate storage tanks, and daily tailpipe and fugitive dust emissions from operations traffic. During the operational phase of the Proposed Action, NOX, CO, VOC, and HAP emissions would result

from the long-term operation of condensate storage tank vents, and well pad separators. Additionally, road dust (PM10 and PM2.5) would be produced by vehicles servicing the wells.

Project emissions of ozone precursors, whether generated by construction and drilling operations, or by production operations, would be dispersed and/ or diluted to the extent where any local ozone impacts from the Proposed Action would be indistinguishable from background or cumulative conditions. The primary sources of HAPs are from oil storage tanks and smaller amounts from other production equipment. Small amounts of HAPs are emitted by construction equipment. However, these emissions are estimated to be less than 1 ton per year. Based on the negligible amount of project-specific emissions, the Proposed Action is not likely to violate, or otherwise contribute to any violation of any applicable air quality standard, and may only contribute a small amount to any projected future potential exceedance of any applicable air quality standards.

The construction, drilling, completion, testing, and production of an oil and gas well could result in various emissions that affect air quality. Construction activities result in emissions of particulate matter. Well drilling activities result in engine exhaust emissions of NOx, CO, and VOC. Completion and testing of the well result in emissions of VOC, NOX, and CO. Ongoing production results in the emission of NOx, CO, VOC, and particulate matter.

Due to the very small level of anticipated development, an emissions inventory (EI) has not been conducted for this lease sale. A typical oil and gas well EI is estimated for the purpose of this analysis and is based on the following assumptions:

- Each oil and gas well would cause approximately 12 acres of surface disturbance. This acreage includes access.
- Construction activity for each well is assumed to be 10 days. It is further assumed that, based on the acreage disturbed, 4.5 days would be spent in well pad construction and 5.5 days would be spent in road and pipeline construction.
- Control efficiency of 25% for dust suppression would be achieved as a result of compliance with Utah Air Quality regulation R307-205.
- Post construction particulate matter (dust) emissions are likely to occur on a short term basis due to loss of vegetation within the construction and staging areas. Assuming appropriate interim reclamation, these emissions are likely to be minimal to negligible and will not be considered in this EA.
- Drilling operations would require 20-60 days.



- Completions and testing operations would require 3 days.
- Off road mobile exhaust emissions from heavy equipment during construction activities and on road mobile emissions would not be considered as they are dispersed, sporadic, temporary, and not likely to cause or contribute to exceedance of the NAAQS

If exploration occurs, short-term impacts would be stabilized or managed rapidly (within two to five years), and long-term impacts are those that would substantially remain for more than five years. An air quality best management practice (BMP) which discusses the amounts of NOX emission per horse-power hour based on internal combustion engine size, would be attached to all parcels. Stipulation UT-S-01, Air Quality, would consist of the following provisions:

- All new and replacement internal combustion gas field engines of less than or equal to 300 design- rated horsepower must not emit more than 2 grams of NOx per horsepower-hour. This requirement does not apply to gas field engines of less than or equal to 40 design-rated horsepower.
- All new and replacement internal combustion gas field engines of greater than 300 design rated horsepower must not emit more than 1.0 gram of NOx per horsepower-hour.

Emission factors for activities of the proposed action were based on information contained in the EPA's Emission Factors & AP 42, Volume I, Fifth Edition (EPA.1995), available at: <http://www.epa.gov/ttn/chief/ap42/index.html>.

The production emissions from oil storage tanks was estimated based on the emission factor contained in the Colorado Department of Public Health and Environment PS Memo 05-01, Oil & Gas Atmospheric Condensate Storage Tank Batteries Regulatory Definitions and Permitting Guidance (CDPHE 2009), available at: <http://www.cdphe.state.co.us/ap/down/ps05-01.pdf>

**Table 2. Emissions Estimate**

|  | Construction Emission (Tons) | Drilling Emission (Tons) |      |      | Completions Emission (Tons) |      |      |      | Ongoing Production Emission (Tons/Year) |      |      |       |
|--|------------------------------|--------------------------|------|------|-----------------------------|------|------|------|---|------|------|-------|
|  | PM10                         | NOx                      | CO   | VOC  | VOC                         | NOx  | CO   | PM10 | NOx                                     | CO   | VAC  | PM10  |
| Typical Well   | .34                          | 13.31                    | 1.83 | 0.23 | 0.85                        | 0.07 | 0.07 | 0.00 | 0.01                                    | 0.01 | 6.44 | 0.000 |
| Sub Total  | .34                          | 13.31                    | 1.83 | 0.23 | 0.85                        | 0.07 | 0.07 | 0.00 | 0.01                                    | 0.01 | 6.44 | 0.000 |
|  |                              |                          |      |      | PM10                        | NOx  | CO   | VOC  |   |      |      |       |
| Activities Emission (Total Emissions for Drilling and Completing a Well) |                              |                          |      |      | 0.34                        | 13.3 | 1.89 | 1.08 | Tons                                    |      |      |       |
| Production Emission (Ongoing Annual Emission for the Well)               |                              |                          |      |      | 0.000                       | 0.01 | 0.01 | 6.44 | tpy                                     |      |      |       |

Emissions estimates for GHG's were not prepared, as single-well GHG emissions would be well under the 25,000 ton per year EPA reporting threshold. Based on the emissions estimates contained in Table 4, and considering the location of the proposed leasing relative to population centers and Class 1 areas, substantial air resource impacts are not anticipated as a result of this leasing action, and no further analysis or modeling is warranted. Emissions resulting from the lease sale are not likely to result in major impacts to air quality nor are they likely to cause a violation of the NAAQS.

Additional air quality control measures may be warranted and imposed at the APD stage. These control measures are dependent on future regional modeling studies, other analysis or changes in regulatory standards. As such, a lease notice would be appropriate to inform an operator or the general public that additional air quality control measures would be pursued. Lease notices UT-LN-99 (Regional Ozone Formation Controls) and UT-LN-102 (Air Quality Analysis) would be attached to all lease parcels.

To address oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required through a lease notice (UT-LN-99, Regional Ozone Formation Controls) for any development projects related to this lease sale:

- Tier II or better drilling rig engines
- Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines <300HP and 1g NOx/bhp-hr for engines >300HP
- Low bleed or no bleed pneumatic pump valves
- Dehydrator VOC emission controls to +95% efficiency
- Tank VOC emission controls to +95% efficiency

### **Green House Gases and Climate Change**

As explained in Section 3.3.1 and the recent CEQ guidance, the effects of climate change observed to date and projected to occur in the future include more frequent and intense heat waves, longer fire seasons and more severe wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea-level rise, more intense storms, harm to water resources, harm to agriculture, ocean acidification, and harm to wildlife and ecosystems.

There would be no GHG emissions as a direct result of the Proposed Action, which is administrative in nature – i.e., issuance of leases for Federal mineral resources. Nevertheless, the BLM recognizes that GHG emissions are a potential effect of the subsequent fluid mineral

exploration and/or development of any leases that are issued. Oil and gas activities may lead to the installation and production of new wells, which may consequently produce an increase in GHG emissions. The primary sources of GHG emissions include the following:

- Fossil fuel combustion for construction and operation of oil and gas facilities – vehicles driving to and from production sites, engines that drive drill rigs, etc. These produce CO<sub>2</sub> in quantities that vary depending on the age, types, and conditions of the equipment as well as the targeted formation, locations of wells with respect to processing facilities and pipelines, and other site-specific factors;
- Fugitive CH<sub>4</sub> – CH<sub>4</sub> that escapes from wells (both gas and oil), oil storage, and various types of processing equipment. This is a major source of global CH<sub>4</sub> emissions. These emissions have been estimated for various aspects of the energy sector, and starting in 2011, producers are required under 40 CFR 98, to estimate and report their CH<sub>4</sub> emissions to the USEPA; and
- Combustion of produced oil and gas – it is expected that future operations would produce marketable quantities of oil and/or gas. Combustion of the oil and/or gas would release CO<sub>2</sub> into the atmosphere. Fossil fuel combustion is the largest source of global CO<sub>2</sub>.

In recent years, many states, tribes, and other organizations have initiated GHG inventories, tallying GHG emissions by economic sector. The U.S. EPA provides links to statewide GHG emissions inventories (USEPA, 2015c). Guidelines for estimating project-specific GHG emissions are available (URS Corporation, 2010), but some additional data, including the projected volume of oil or natural gas produced for an average well, number of wells (as well as other factors described in Section 4.2.1. Air Quality) were used to provide GHG estimates.

### **Rule of Reason**

CEQ advises that agencies should be guided by a “rule of reason” in ensuring that the level of effort expended in analyzing GHG emissions or climate change effects is reasonably proportionate to the importance of climate change related considerations to the agency action being evaluated. This statement is grounded in the purpose of NEPA to concentrate on matters that are truly significant to the proposed action (40 CFR §§ 1500.4(b), 1500.4(g), 1501.7.). CEQ guidance cautions against using a comparison of global GHG emissions to project-specific GHG emissions as a stand-alone reason for no detailed analysis [CEQ 2016]. In light of the difficulties in attributing specific climate impacts to individual projects, CEQ recommends agencies use the projected GHG emissions as a proxy for assessing a Proposed Action’s potential climate change impacts [CEQ, 2016].

### **Direct Greenhouse Gas Emissions**

Direct greenhouse gas emissions from speculative future oil and gas well production on the proposed lease parcels was calculated assuming one well per parcel. Total Greenhouse Gas Warming Potential (GWP), which includes direct emissions of carbon dioxide, methane, and

nitrous oxide from an oil or gas producing well is estimated based on using a generic emissions calculator available on the BLM Utah Air Quality webpage ([http://www.blm.gov/ut/st/en/prog/more/air\\_quality/airprojs.html](http://www.blm.gov/ut/st/en/prog/more/air_quality/airprojs.html)) which shows emissions of 1,192 tons per year CO<sub>2</sub>-e for a single operational well, and 2,305 tons per year CO<sub>2</sub>-e for a single drill rig.

### **Indirect Greenhouse Gas Emissions**

Normally, indirect GHG emissions are estimated based on an average cumulative production rate based on the production history for the townships in which the parcels are located, but because there is no production history of the area around the parcels, the production rate of 64,637.75 barrels of oil over the life of a well for parcels in the Richfield Field Office are used for this analysis. Only oil production is estimated, as it is not anticipated any gas production will occur on these parcels. Indirect GHG emissions are also only calculated for carbon dioxide based on combustion of the product.

Using an RFD of one well drilled per parcel, and an EPA emissions factor (EPA, 2016) of 0.43 Metric tons of CO<sub>2</sub> per Barrel, indirect GHG emissions can be estimated at 27,794 metric tons per parcel. Actual GHG emissions may range from zero (assuming no lease parcels sold or developed) to an indeterminate upper range based on realized production rates, control technology, and physical characteristics of any oil produced.

As it is not possible to assign a “significance” value or impact to these numbers, the emissions estimates themselves are presented as a proxy for impact. This is consistent with final CEQ guidance (CEQ, 2016).

### **Uncertainties of GHG Calculations**

Although this EA presents a quantified estimate of potential GHG emissions associated with reasonably foreseeable oil and gas development, there is significant uncertainty in GHG emission estimates due to uncertainties with regard to eventual production volumes and variability in flaring, construction, and transportation.

### **End Uses**

The estimates above provide a complete GHG lifecycle of a well from site inspection to possible indirect emissions through combustion. A rough estimate was possible using publicly available information and using estimates from future production for reasonably foreseeable development. With respect to the rough estimates of indirect CO<sub>2</sub> emissions, it should be noted that it is difficult to discern with certainty what end uses for the fuels extracted from a particular leasehold might be reasonably foreseeable. For instance, some end uses of fossil fuels extracted from Federal leases include: combustion of transportation fuels, fuel oils for heating and electricity generation, as well as production of asphalt and road oil, and the feedstocks used to

make chemicals, plastics, and synthetic materials. At this time, there is some uncertainty with regard to the actual development that may occur.

It is important to note that the BLM does not exercise control over the specific end use of the oil and gas produced from any individual federal lease. The BLM has no authority to direct or regulate the end use of the produced oil and/or gas. As a result, the BLM can only provide an estimate of potential GHG emissions using national approximations of where or how the end use may occur because oil, condensate, and natural gas could be used for combustion of transportation fuels, fuel oils for heating and electricity generation, as well as production of asphalt and road oil, and the feedstocks used to make chemicals, plastics, and synthetic materials.

### **Availability of Input Data**

In light of the difficulties in attributing specific climate impacts to individual projects, CEQ recommends agencies use the projected GHG emissions as a proxy for assessing a Proposed Action's potential climate change impacts. Estimates were made based on readily available data and reasonable assumptions about potential future development. There are many factors that affect the potential for GHG emissions estimates at the leasing stage: a lease may not be purchased, so no GHG emissions would be expected; a lease may be purchased but never explored, so again there would be no GHG emissions; a lease may be purchased and an exploratory well drilled that showed no development potential, so minimal GHG emissions would occur; or a lease may be purchased, explored, and developed. If developed there are notable differences in the potential for emissions related to a wide variety of variables, including the production potential of the well, economic considerations, regulatory considerations, and operator dynamics, to name a few. Further NEPA analysis would be conducted at the APD stage, when specific development details with which to analyze potential GHG emissions are likely to be known.

### **Monetizing Costs and Benefits: Social Cost of Greenhouse Gases**

The 2016 CEQ guidance states that "NEPA does not require monetizing costs and benefits" and allows for agency discretion in including monetized assessment of the impacts of GHGs in NEPA documents (CEQ, 2016). The BLM finds that including monetary estimates of the social cost of GHGs (SC GHG) in its NEPA analysis for this Proposed Action would not be useful. Since the BLM is not doing a cost-benefit analysis in this NEPA document, we do not believe monetizing only SCC would be instructive.

### **Possible Future Best Management Practices, Standard Operating Procedures, and/or Mitigation Measures**

The BLM holds regulatory jurisdiction over portions of natural gas and petroleum systems, identified in the USEPA *Inventory of U.S. Greenhouse Gas Emissions and Sinks* (USEPA, 2016i). Exercise of this regulatory jurisdiction has led to development of Best Management

Practices (BMPs), which are state-of-the-art mitigation measures applied to oil and natural gas drilling and production to help ensure that energy development is conducted in an environmentally responsible manner. The BLM encourages industry to incorporate and implement BMPs to reduce impacts to air quality through reduction of emissions, surface disturbances, and dust from field production and operations. Typical measures are mentioned below.

- Open burning of garbage or refuse would not occur at well sites or other facilities;
- Drill rigs would be equipped with Tier II or better diesel engines;
- Vent emissions from stock tanks and natural gas TEG dehydrators would be controlled by routing the emissions to a flare or similar control device which would reduce emissions by 95% or greater;
- All internal combustion equipment would be kept in good working order;
- Flared hydrocarbon gases at high temperatures in order to reduce emissions of incomplete combustion through the use of multi-chamber combustors;
- Watering dirt roads during periods of high use to reduce fugitive dust emissions;
- Co-location wells and production facilities to reduce new surface disturbances;
- Use of natural gas fired or electric drill rig engines;
- The use of selective catalytic reducers and low-sulfur fuel for diesel-fired drill rig engines;
- Adherence to BLM's Notice to Lessees' (NTL) 4a concerning the venting and flaring of gas on Federal leases for natural gas emissions that cannot be economically recovered;
- Protecting from sand from wind erosion;
- Implementation of directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores;
- Requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and
- Performing interim reclamation to reclaim areas of the pad not required for production facilities and to reduce the amount of dust from the pads.

Additionally, the BLM encourages oil and natural gas companies to adopt proven, cost-effective technologies and practices that improve operational efficiency and reduce natural gas emissions. In October 2012, USEPA promulgated air quality regulations for completion of hydraulically fractured gas wells (USEPA, 2015b). These rules required air pollution mitigation measures that reduced the emissions of volatile organic compounds during gas well completions. Mitigation included utilizing a process known as a "green" completion in which natural gas brought up during flowback is captured in tanks rather than in open fluid pits. Among other measures to reduce emissions include the USEPA's Natural Gas STAR program. The USEPA U.S. inventory data shows that industry's implementation of BMPs proposed by the program has reduced emissions from oil and gas exploration and development (USEPA, 2016i).

#### **4.2.1.2 Cultural Resources**

As stated in Section 3.3.2, site densities in the three proposed parcels are expected to be low for parcels UT-0517-042 and 043 and moderate for parcel UT-0517-044. BLM determined that reasonable development (one 5-acre well pad) could occur within parcel 042 with no adverse effects to historic properties as defined in 36 CFR 800.5.

BLM consulted with Federally recognized tribes who use and/or continue to use the area within the SGFO land management jurisdiction and also invited and consulted with other parties consistent with 36 CFR 800.2(c)(5). BLM consulted with the State Historic Preservation Officer (SHPO) on a finding of not adverse effect to historic properties on January 9, 2017.

#### **4.2.1.3 Lands with Wilderness Characteristics**

The presence or absence of wilderness characteristics are primarily affected by the construction or maintenance of wilderness inventory roads, the number and proximity of motorized travel corridors within the area; the volume and type of traffic on those corridors; infrastructure development; mineral extraction; and the quantity and type of recreational users. To a lesser extent, range and wildlife management projects can affect lands with wilderness characteristics.

Although the issuance of the lease would not directly impact the wilderness characteristics (naturalness, solitude, and primitive unconfined recreation) of the area, the issuance of leases does convey an expectation that drilling and development would occur. The potential development of the lease would likely cause indirect impacts to wilderness characteristics. A number of variables would influence the degree of impact to lands with wilderness characteristics, including where surface-disturbing activities occur, land form or topography, vegetation type, sequence of development, and reclamation time. If drilling and development were to occur in lands with wilderness characteristics, the wilderness characteristics in that area would likely be reduced. Impacts could include loss of naturalness and loss of opportunities for solitude or primitive unconfined recreation. Additional impacts from development could include a reduction in the size of the unit. Development associated with oil and gas leasing (e.g., well pads, access roads) could bisect or fragment a portion of the wilderness characteristics unit so that all or part of the unit no longer meets the size criteria.

Lease parcels include approximately 595 acres (~6.2%) of the Smith Mesa unit (UT-040-141). Even if drilling and associated activities resulted in the loss of wilderness characteristics throughout the leased areas, the remaining acres within the Smith Mesa unit that retain wilderness characteristics would be approximately 9,000 acres, which is above the 5,000 acre size requirement.

Portion of lease parcels UT-0517-042 and UT0517-043 would be leased under lease stipulation UT-S-107 – CSU-Fragile Soils and UT-S-125 – NSO-Riparian Zones to protect fragile soils,

slopes and riparian areas. However, a portion of parcels UT-0517-042 and UT0517-043 would be leased under standard oil and gas leasing stipulations.

This portion of the Smit Mesa unit (UT-040-141) that contains steep slopes, fragile soils or riparian areas is unlikely to be directly or indirectly affected by a fluid mineral lease. The terrain is very steep, dropping 400 vertical feet in ¼ mile, giving it an average slope of 30%. Lease Stipulation UT-S-107 states, “Control surface use on severely erodible soils on slopes equal to or greater than 25 percent” and contains no waivers, modifications or exceptions.

However, along top of Smith Mesa the terrain is relatively flat and could support extraction activities. Any activities that occurred would likely result in the loss or wilderness characteristics, at least for the duration of the drilling activities and until reclamation efforts were completed. Where development occurs, wilderness characteristics would be negatively affected; however, mitigation and project design features identified during future site-specific analysis could reduce the potential impacts to wilderness characteristics.

#### **4.2.1.4 Migratory Birds**

Potential impacts to migratory bird species occurring from oil and gas exploration and development may include: 1) during exploration and development surface disturbing activities, migratory birds maybe disturbed and/or killed, and their nests destroyed causing short-term impacts, 2) during exploration and development surface disturbing activities, migratory birds maybe disturbed and displaced to adjacent habitats causing short-term impacts, but would return to these areas once disturbances ceased, 3) during development of oil and gas, any permanent roads or facilities established would cause a loss of general terrestrial habitat for migratory birds in the long term, and 4) any permanent roads (if open to the public) or permanent facilities (with permanent noise) may affect nesting and non-nesting birds through long-term disturbances.

The following conservation measures for protection of raptors and other migratory birds are recommended:

- Activities would comply with Utah BLM BMPs for Raptors and Their Associated Habitats in Utah (Appendix D).
- Project activities would not occur within recommended spatial and seasonal buffers for raptors, unless otherwise approved. If existing topography limits line-of-sight between an active nest and construction activities, spatial and seasonal buffers may be reduced.
- Construction activities would be limited during the migratory bird nesting period (February 1 to August 15) or a migratory bird nesting survey would be completed in areas proposed for disturbance during this time period.



Should an active migratory bird nest be discovered, the appropriate agency biologist would be notified and an appropriate buffer established around the nest until the migratory bird nesting period is over or young have fledged.

#### **4.2.1.5 Recreation**

It is difficult to quantify impacts to dispersed recreation, but it is likely that those lease parcels located near housing developments or developed access point (trailheads, etc.) receive the most use. Recreationists would likely be displaced by any lease development activities.

The Flying Monkey mountain bike trail is within parcels UT-0517-042 and UT-0517-043. This is an expert only, double black diamond, downhill specific trail. Individuals who enjoy extreme, high speed riding use this trail and would not be expected to have their recreation experience diminished by oil and gas development in the vicinity of this trail, as their experiences are not dependent on pristine natural settings.

#### **4.2.1.6 Socio-Economics**

The social and economic environments of Washington County would be positively affected by the proposed project. Exploratory drilling of oil and gas in the project area would contribute to the local economy by providing several benefits: short-term employment opportunities for construction, drilling and completion; monies to local contractors; and revenues recycled into the area's local economy. Additional revenues would be generated in the form of sales taxes and income taxes. Local workers would potentially be used in the project work, and they would likely spend much of their income in local economies, thus producing a "multiplier effect" that could be at least 1.5 times the revenues generated from the proposed project.

The Proposed Action would add to the short-term opportunities for employment in Washington County, especially for workers associated with the support of the oil and gas industry. The average cost to construct, drill and complete an individual well is approximately \$5,000,000 if four wells were drilled the economic impact would be approximately \$20,000,000.

If the proposed well is productive, long-term employment opportunities would likely be generated for at least one pumper and three tanker truck drivers. If the well is productive, income to the federal government, State of Utah and Washington County would be generated in the form of royalties, sales taxes, income taxes, and property taxes for the producing well. Furthermore, if the well is productive, field development would likely be pursued by the applicant, thereby potentially resulting in additional short-term and long-term employment opportunities, royalties, sales taxes, income taxes, and property taxes.

If production is established from a well and/or additional wells, the development of oil and gas could lead to long-term impacts to the social structure of the communities, changes in the

economic base, and an increased demand for local government services. These impacts could include increased revenues in the local economy, an increase in the tax base, change in the social structure of the local community, and increased demand for community services and strain on the infrastructure (schools, hospitals, law enforcement, fire protection, and other community needs). These possible social and economic changes are beyond the scope of this document and to make those projections would be speculative at best.

Negative socioeconomic impacts may also stem from oil and gas exploration and development activities. These impacts are difficult to quantify accurately due to complex interactions, feedback loops, changing and unknown parameters. Adverse social and economic consequences for areas adjacent to rapid oil and gas development might include, for example, higher costs of living and decreases in recreational tourism revenue. While such impacts may occur, accurate valuation is not currently possible in a predictive capacity and, given the scale of the Proposed Action (four wells drilled); negative impacts of even a moderate degree should not be anticipated.

#### **4.4.1.7 Threatened, Endangered or Candidate Animal Species**

##### **Mexican Spotted Owl**

Direct or indirect impacts to the MSO are unlikely because the proposed lease parcels are located in marginally suitable habitat for this species. The above mentioned parcels are on the edge of designated critical habitat which is potentially foraging and dispersal habitat. No adverse direct or indirect impacts to MSOs are anticipated. The proposed project “may affect, but would not likely adversely affect” MSOs.

##### **Southwestern Willow Flycatcher**

Two out of the 3 proposed oil and gas parcels, UT0517-042 (North Creek) and UT0517-044 (Ash Creek), contain riparian habitat. In 1999, the St. George RMP (BLM 1999) classified these parcels as “Open” to oil and gas leasing, with No Surface Occupancy (NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development. Each of these riparian area within the project area was field checked (see attach survey sheets) and determined to be unsuitable for SWIFL nesting; however, these riparian areas do provide opportunities for SWIFLs during migration (stop over habitat). The NSO classification should provide protection to riparian areas and provide opportunities for potential migrating SWIFLs. No significant direct or indirect impacts to SWIFLs are anticipated. The proposed project “may affect, but would not likely adversely affect” SWIFLs.

##### **Western Yellow-Billed Cuckoo**

Two out of the 3 proposed oil and gas parcels, UT0517-042 (North Creek) and UT0517-044 (Ash Creek), contain riparian habitat. In 1999, the St. George RMP (BLM 1999) classified these parcels as “Open” to oil and gas leasing, with No Surface Occupancy (NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development. Each of these riparian area within the project area was field checked (see attach survey sheets) and determined to be unsuitable for cuckoo nesting; however, these riparian areas do provide opportunities for cuckoos during migration (stop over habitat). The NSO classification should provide protection to riparian areas and provide opportunities for potential migrating cuckoos. No adverse direct or indirect impacts to cuckoos are anticipated. The proposed action “may affect, but would not likely adversely affect” cuckoos.

#### **4.2.1.8 Visual Resources**

The issuance of leases would not directly impact the scenic qualities of the proposed lease parcels. However, as the BLM generally cannot deny all surface use of a lease unless the lease is issued as a No Surface Occupancy stipulation, the issuance of leases does convey an expectation that drilling and development would occur. For the purposes of this analysis, impacts to visual resources would be considered relevant if the impacts of the proposed project do not conform to an area's designated visual resource management (VRM) class objectives.

The potential direct adverse impacts to visual resources would include the visual contrasts created by construction equipment, pipelines, well pads, temporary and permanent access roads, and other forms of infrastructure associated with oil and gas exploration and development. In general, drilling rigs and equipment, construction and maintenance vehicles, development infrastructure, and surface disturbance, including roads, would impact an area's scenic quality and appearance of naturalness with human-made form, color, and linear contrasts. A visual contrast rating process will be used for the VRM analysis, which involves comparing the project features with the major features in the existing landscape to determine whether the scenic values of the BLM managed lands within each parcel have been maintained when an APD is received and if the areas are proposed for exploration.

#### **4.2.1.9 Wildlife Excluding USFWS Designated Species**

The Utah Division of Wildlife Resources (UDWLR) has established areas that are crucial seasonal ranges for mule deer, desert bighorn sheep and pronghorn. UDWR classifies seasonal ranges on the basis of distribution, abundance, forage availability and availability to the animals. “Crucial habitat” is defined as “sensitive use areas that, because of limited abundance and/or unique qualities, constitute irreplaceable crucial requirements for high interest wildlife.”

The impacts of energy development on mule deer are not fully known but generally include direct and indirect loss of habitat, added physiological stress, disturbance and displacement,

habitat fragmentation and isolation, and other secondary effects (e.g., oil/chemical spills and contamination, increased noxious weeds, etc.; Sawyer et al. 2002, Lutz et. al. 2011). Small, isolated disturbances within non-limiting habitats are of minor consequence within most ecosystems. However, larger-scale developments within limited habitat types are a major concern to managers because such impacts cannot be relieved or absorbed by surrounding, unaltered habitats (Watkins et al. 2007). For mule deer populations to thrive in areas of extensive energy development, it is essential to work closely with energy companies to minimize and mitigate for potential impacts.

Minimizing disturbance to mule deer is a high priority when balancing energy development, recreation, and other uses on mule deer winter ranges.

Potential impacts to BLM Sensitive, and general wildlife species occurring from oil and gas exploration and development may vary greatly depending on which parcel is developed, what habitats are disturbed (black brush supports less wildlife species and lower densities of those species than does pinyon/juniper habitat), and the season of the year the work is completed. Each site would be different with varying amounts of access road required, drill pad size (due to slope), soil texture and the extent of drilling. Special stipulations or best management practices (BMP) could lessen overall direct and indirect impacts to BLM Sensitive and general wildlife species.

General impacts during the exploration phase may include: 1) during construction of access roads, drill pads and the drilling operation, small mammals, reptiles, amphibians, and birds maybe disturbed and/or killed, and their nests, or dens destroyed causing short-term impacts, 2) during the construction activities, larger and more mobile animals maybe disturbed and/or displaced to adjacent habitats causing short-term impacts, and 3) impacts to BLM Sensitive and general wildlife species would be significantly higher if surface disturbances occurred adjacent to riparian habitats, on steeper sloping habitats, or on fragile and erodible soils.

General impacts during the development phase may include: 1) permanent roads would be maintained, and facilities built to facilitate production causing a loss of general terrestrial habitat in the area, 2) if roads are allowed to stay open to the public, additional disturbances would result from increased traffic on roads, and 3) operation of wells may result in a “noise factor” which may disturb BLM Sensitive and general wildlife species in adjacent habitats.

#### **4.2.2 Alternative B – No Action**

This alternative (not to offer any of the nominated parcels for sale) may not meet the need for the proposed action.

##### **4.2.2.1 Air Quality/Green House Gases and Climate Change**

Under the no action alternative no direct or indirect GHG emissions would occur from any potential future production from these lease parcels.

#### **4.2.2.2 Cultural Resources**

The No Action alternative would not result in potential impacts to Cultural Resources because the parcels would not be leased or developed.

#### **4.2.1.3 Lands with Wilderness Characteristics**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.4 Migratory Birds**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.5 Recreation**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.6 Socio-Economics**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.7 Threatened, Endangered or Candidate Animal Species**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.8 Visual Resources**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

#### **4.2.2.9 Wildlife Excluding USFWS Designated Species**

The No Action alternative would not result in potential impacts because the parcels would not be leased or developed.

### **4.3 Cumulative Impacts Analysis**

A cumulative impact is defined in Council on Environmental Quality (CEQ) regulations (40 CFR §1508.7) as “the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.” Cumulative impacts can result from individually minor but collectively major actions taking place over a period of time. Past and present actions and reasonably foreseeable future actions with the potential to contribute to cumulative effects are discussed below followed by an analysis of cumulative effects. All resource values addressed in Chapter 3 have been evaluated for cumulative effects. If, through the implementation of mitigation measures or project design features, no net effect to a particular resource results from an action, then no cumulative effects result.

Even though the Proposed Action of leasing would not contribute to cumulative effects on air resources, future foreseeable development could contribute to cumulative GHG emissions. The primary sources of emissions include the following:

- Fossil fuel combustion for construction and operation of oil and gas facilities – vehicles driving to and from production sites, engines that drive drill rigs, etc. These produce CO<sub>2</sub> in quantities that vary depending on the age, types, and conditions of the equipment as well as the targeted formation, locations of wells with respect to processing facilities and pipelines, and other site-specific factors.
- Fugitive CH<sub>4</sub> – CH<sub>4</sub> that escapes from wells (both gas and oil), oil storage, and various types of processing equipment. This is a major source of global CH<sub>4</sub> emissions. These emissions have been estimated for various aspects of the energy sector, and starting in 2011, producers are required under 40 C.F.R. §98, to estimate and report their CH<sub>4</sub> emissions to the EPA.
- Combustion of produced oil and gas – it is expected that operations will produce marketable quantities of oil and/or gas. Combustion of the oil and/or gas would release CO<sub>2</sub> into the atmosphere. Fossil fuel combustion is the largest source of global CO<sub>2</sub>.

Since climate change and global warming are global phenomena, for purposes of this NEPA analysis, the analysis presented above about the direct and indirect effects of GHG emissions from the proposed actions is also an analysis of the cumulative effects of the proposed actions. Consistent with CEQ guidance, the BLM has determined that this analysis “adequately addresses the cumulative impacts for climate change from the proposed action and its alternatives, and therefore a separate cumulative effects analysis for GHG emissions is not needed.

The past, current and future activities would cumulatively increase the modification done to the landscape and hence visual resources. This is viewed as negative impact when assessing the scenic quality of an area. The proposed action would contribute to these cumulative impacts by making three parcels available for lease and mineral development (Approximately 2,725 acres in VRM Class II, and 2,012 acres in VRM Class III). Visual contrast analysis will be conducted to determine if development is in compliance with VRM standards when/if the project proponents

begin the work of developing the minerals within the parcels. When a plan of development is created, site specific VRM analysis will be conducted.

Following the passage of OPLMA in 2009, Congress designated 14 wilderness areas on BLM-managed lands in Washington County and three areas within Zion National Park. When combined with USFS wilderness in the Pine Valley Ranger District, there are 220,439 acres of designated wilderness in Washington County. This is 14% of the entire county. For BLM-managed lands the number is significantly higher. Over half of the wilderness in the county, 129,000 acres, is on land managed by the SGFO. This is 20% of the total BLM-managed acres in Washington County, or to put it another way, one out of every five acres managed by the SGFO is designated wilderness. The cumulative impact area for lands with wilderness characteristics for this EA includes all lands with wilderness characteristics and designated wilderness in the SGFO. The past, present, and foreseeable future actions with the potential to contribute to surface disturbance include development of new and existing mineral rights (leases) and/or realty actions (for example, pipeline or road rights-of-way). Reasonably foreseeable actions related to the implementation of the proposed action could result in the loss wilderness characteristics within the units affected. The No Action alternative would not contribute any cumulative impacts.

A variety of activities, such as sightseeing, biking, camping, and hunting, have occurred and are likely to continue to occur near or within some or all of the nominated parcels; these activities likely result in positive impacts to the socio-economics of Washington County. Other activities, such as farming, livestock grazing, vegetation projects, and wildland fire, have also occurred within some or all of the nominated parcels and are likely to occur in the future. These types of activities are likely to have a greater impact on resources in the project area because of their more concentrated nature. Because these activities are occurring within the nominated parcel boundaries, they have the potential to contribute to cumulative effects.

The cumulative impacts as described in the St. George RMP/FEIS are incorporated by reference to Chapter 4. The past, present, and foreseeable future actions with the potential to contribute to surface disturbance include development of new and existing mineral rights or realty actions (for example, pipeline or road rights of way) or the continuation of agricultural & recreational activities. The No Action alternative would not contribute any cumulative impacts.

## **5.0 CONSULTATION AND COORDINATION**

### **5.1 Introduction**

Public and agency involvement has occurred as described in sections 5.2 and 5.3 below.

### **5.2 Persons, Groups, and Agencies Consulted**

| Name | Purpose & Authorities for Consultation or | Findings & Conclusions |
|------|---|------------------------|
|------|---|------------------------|

|   |  |  |
|---|--|--|
|   | Coordination                                 |  |
| U.S. Fish & Wildlife Service                            | Section 7 ESA                                | A letter was sent to the USFWS on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale. Coordination with USFWS for the May 2017 lease sale is ongoing. Formal consultation was completed as part of the RFO RMP/ROD in the form of the Biological Opinion. Threatened and endangered species are not present on the subject parcels. |
| Utah State Historic Preservation Office                 | Section 106 NHPA                             | A consultation request letter was sent to SHPO with a determination of no adverse effect.  |
| State of Utah's Public Lands Policy Coordination Office | Coordinated with as leasing program partner. | A letter was sent on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale.  |
| Utah Division of Wildlife Resources                     | Agency with expertise.                       | A letter was sent on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale.  |
| National Park Service, Salt Lake City Office            | Coordinated with as leasing program partner. | A letter was sent on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale.  |
| U.S. Forest Service, Intermountain Region               | Coordinated with as leasing program partner. | A letter was sent on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale.  |



|   |  |   |
|---|--|---|
| Utah School and Institutional Trust Lands Administration  | Coordinated with as leasing program partner.         | A letter was sent on August 23, 2016 which provided the preliminary list and notified them of the June 2017 lease sale.   |
| Paiute Indian Tribe of Utah<br>Hopi Tribe   | American Indian Religious Freedom Act (1978)<br>NHPA | A letter was sent to each of these tribes on October 6, 2016 informing them of the proposed action and soliciting any comments. The Hopi responded in a letter dated October 25, 2016 requesting a copy of the report. A copy of the report was sent to tribes on October 18, 2016. |
| Washington County Commissioners   | Coordination   | Proposed project was discussed with the Washington County Commissioners at the Commissioners meeting on December 6, 2016.   |
| Utah Professional Archaeological Council (UPAC)<br>Utah Statewide Archaeological Society (USAS)<br>Utah Rock Art Research Association (URARA)<br>Southern Utah Wilderness Alliance (SUWA) | NHPA   | A letter inviting these parties to participate as consulting parties in the Section 106 process was sent on October 6, 2016. URARA and SUWA requested to be consulting parties. A copy of the cultural resource report was sent to them on November 18, 2016.                       |

### 5.3 Summary of Public Participation

In order to meet the intent of the CEQ regulations that require an “early and open process for determining the scope of issues to be addressed and for identifying significant issues related to a Proposed Action” (40 CFR 1501.7) several actions were taken to involve the public.

On November 17, 2016 the public was notified of the proposed action by posting on the BLM eplanning website. The process used to involve the public also includes a 30-day public review and comment period for the EA and unsigned FONSI offered from January 11, 2017 to February 10, 2017 .

All the information related to this EA is maintained on the identified websites (eplanning and Oil and Gas Leasing).

BLM utilized and coordinated the NEPA public participation requirements to assist the agency in satisfying the public involvement requirements under Section 106 of the National Historic Preservation Act (NHPA) (16 U.S.C. 470(f) pursuant to 36 CFR 800.2(d)(3). The information about historic and cultural resources within the area potentially affected by the proposed project/action/approval will assist the BLM in identifying and evaluating impacts to such resources in the context of both NEPA and Section 106 of the NHPA. BLM consulted with Indian tribes on a government-to-government basis in accordance with Executive Order 13175 and other policies. Tribal concerns, including impacts on Indian trust assets and potential impacts to cultural resources, were given due consideration. Federal, State, and local agencies, along with tribes and other stakeholders that may be interested in or affected by the proposed project/action/approval were invited to participate in the scoping process.

### **5.3.1 Modifications Based on Public Comment and Internal Review**

### **5.3.2 Response to Public Comment**

### **5.4 List of Preparers**

| Names        | Title                         | Responsible for the Following Section(s) of this Document  |
|--------------|-------------------------------|--|
| Dave Corry   | Natural Resource Specialist   | Team Lead; Water Resources/Quality; Wetlands /Riparian Zones; Hydrology; Fuels/Fire Management; and Woodland/Forestry; Floodplains; Farmlands (Prime or Unique); and Soils/Watershed; Environmental Justice; Wastes (Hazardous or Solid), Geology/Mineral Resources/Energy Production; Paleontology; and Socio-Economics |
| Leonard Herr | Physical Scientist            | Air Quality; Greenhouse Gases and Climate Change   |
| Dave Kiel    | Outdoor Recreation Specialist | ACEC's; Recreation; Visual Resources; Wild and Scenic  |

|               |                                 |   |
|---------------|---------------------------------|---|
|               |                                 | Rivers; and Wilderness  |
| Ryan Reese    | Rangeland Management Specialist | Invasive Species(Noxious Weeds); Livestock Grazing/Rangeland Health; Standards and Guidelines; Wild horse and Burros  |
| Lori Hunsaker | Archeologist                    | Cultural Resources; and Native American Religious Concerns  |
| Bob Douglas   | Wildlife Biologist              | Fish and Wildlife; Migratory Birds; Utah Sensitive Plant and Animal Species other than FWS Candidate or Listed Species; Vegetation; Threatened, Endangered, or Candidate Animal Species; and Threatened, Endangered, or Candidate Plant Species |
| Teresa Burke  | Realty Specialist               | Lands/Access  |

## 6.0 REFERENCES, ACRONYMS AND APPENDICES

### 6.1 References Cited

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## **6.2 List of Acronyms**

ACEC Areas of Critical Environmental Concern  
APD Application for Permit to Drill  
BLM Bureau of Land Management  
BMP Best Management Practice  
BCR Bird Conservation Region  
CFR Code of Federal Regulations  
CIA Cumulative Impact Area  
CSU Controlled Surface Use  
CWCS Comprehensive Wildlife Conservation Strategy  
DR Decision Record  
EA Environmental Assessment  
EIS Environmental Impact Statement  
EPA Environmental Protection Agency  
ESA Endangered Species Act  
FEIS Final Environmental Impact Statement  
FEMA Federal Emergency Management Agency  
FLPMA Federal Land Policy and Management Act of 1976  
FONSI Finding of No Significant Impact  
IDPR Interdisciplinary Parcel Review  
IM Instruction Memorandum  
LN Lease Notice  
LUP Land Use Plan  
NCLS Notice of Competitive Lease Sale  
NEPA National Environmental Policy Act  
NHPA National Historic Preservation Act  
NRHP National Register of Historic Places

NSO No Surface Occupancy  
OSHA Occupational Safety and Health Act  
RFAS Reasonably Foreseeable Action Scenario  
RFD Reasonably Foreseeable Development  
RFO Richfield Field Office  
ROD Record of Decision  
ROW Right-of-Way June 2017 Oil and Gas Lease Sale  
SHPO State Historic Preservation Office  
UDWR Utah Division of Wildlife Resources  
USFWS United States Fish & Wildlife Service  
USC United States Code  
USO Utah State Office  
WO Washington Office

### **6.3 List of Appendices**

- A. Oil and Gas Lease Sale List with Stipulations and Lease Notices
- B. Parcel Map
- C. Deferred Parcel List
- D. Interdisciplinary Team Checklist
- E. Migratory Bird Treaty Act
- F. Birds of Conservation Concern (USFWS 2008) occurring in Washington County
- G. Response to Comments

## **APPENDIX A, OIL AND GAS LEASE SALE LIST**

### **OIL AND GAS LEASE SALE LIST**

In addition to the Stipulations listed below, the direction provided in Washington Office Memorandums WO-IM-2005-003 (Cultural Resources Stipulation) and WO-IM-2002-174 (Endangered Species Act Stipulation) should be applied to all parcels.

#### **UT0517 - 042**

T. 41 S., R. 12 W., Salt Lake  
Sec. 11: All  
Sec. 12: Lots 1-8, SENE, NESE, S2SE;  
Sec. 13: Lots 1, 2, NE, NWNW, N2SW, SESW, N2SE  
1,607.74 Acres  
Washington County, Utah  
St. George Field Office

#### **STIPULATIONS**

WO IM 2005-003 Cultural Resource Protection

WO IM 2002-174 Threatened and Endangered Species Act

UT-S-107: CSU-Fragile Soils

UT-S-125: NSO-Riparian Zones

UT-S-241: TL - Crucial Winter Range Mule Deer

UT-S-289: TL - Mexican Spotted Owl Nest Sites

#### NOTICES

UT-LN-40: Golden Eagle Habitat

UT-LN-44: Raptors

UT-LN-45: Migratory Bird

UT-LN-68: Notification and Consultation Regarding Cultural Resources

UT-LN-93: Reservoirs and Perennial Streams

UT-LN-95: Riparian and Riparian-Related Resources

UT-LN-99: Regional Ozone Formation Controls

UT-LN-102: Air Quality Analysis

#### **UT0517 - 043**

T. 41 S., R. 12 W., Salt Lake

Sec. 14: N2, SW, N2SE, SWSE;

Sec. 15: All;

1,242.40 Acres

Washington County, Utah

St. George Field Office

#### STIPULATIONS

WO IM 2005-003 Cultural Resource Protection

WO IM 2002-174 Threatened and Endangered Species Act

UT-S-107: CSU-Fragile Soils

UT-S-125: NSO-Riparian Zones

UT-S-241: TL - Crucial Winter Range Mule Deer

UT-S-289: TL - Mexican Spotted Owl Nest Sites

#### NOTICES

UT-LN-40: Golden Eagle Habitat

UT-LN-44: Raptors

UT-LN-45: Migratory Bird

UT-LN-68: Notification and Consultation Regarding Cultural Resources

UT-LN-93: Reservoirs and Perennial Streams

UT-LN-93: Riparian and Riparian-Related Resources

UT-LN-99: Regional Ozone Formation Controls

UT-LN-102: Air Quality Analysis

#### **UT0517 - 044**

T. 40 S., R. 13 W., Salt Lake

Sec. 14: All;

Sec. 15: E2;

Sec. 22: N2, N2S2, SESE;  
 Sec. 23: NE, W2NW, SWSW, W2NESE, W2SE, W2SESE.  
 1,880.00 Acres  
 Washington County, Utah  
 St. George Field Office

#### STIPULATIONS

WO IM 2005-003 Cultural Resource Protection  
 WO IM 2002-174 Threatened and Endangered Species Act  
 UT-S-107: CSU Fragile Soils  
 UT-S-125: NSO-Riparian Zones  
 UT-S-214: TL - Crucial Winter Range Mule Deer  
 UT-S-289: TL - Mexican Spotted Owl Nest Sites

#### NOTICES

UT-LN-40: Golden Eagle Habitat  
 UT-LN-44: Raptors  
 UT-LN-45: Migratory Bird  
 UT-LN-68: Notification and Consultation Regarding Cultural Resources  
 UT-LN-93: Reservoirs and Perennial Streams  
 UT-LN-93: Riparian and Riparian-Related Resources  
 UT-LN-99: Regional Ozone Formation Controls  
 UT-LN-102: Air Quality Analysis

#### LEASE STIPULATIONS SUMMARY

|   |  |
|---|--|
| <b>H- 3120-1<br/>competitive<br/>(Leases (P)<br/>Illustration 20<br/>(Cultural<br/>Resources<br/>Protection)</b>            | <b>CULTURAL RESOURCE PROTECTION STIPULATION</b><br>This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated. |
| <b>H- 3120-1<br/>competitive<br/>(Leases (P)<br/>Illustration 20<br/>(Threatened<br/>and<br/>Endangered<br/>Species Act</b> | <b>THREATENED AND ENDANGERED SPECIES ACT STIPULATION</b><br>The lease area may now or hereafter contain plants, animals or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that would contribute to a need to list such species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the   |



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|                 | <p>continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. 1531 et seq. including completion of any required procedure for conference or consultation.</p>   |
| <b>UT-S-107</b> | <p style="text-align: center;"><b>CONTROLLED SURFACE USE – FRAGILE SOILS</b></p> <p>Controlled surface use on severely erodible soils as mapped, on slopes equal to or greater than 25 percent.</p> <p>Prior to surface disturbance of fragile soils, it must be demonstrated to the Authorized Officer through a plan of development that the follow performance objectives will be met.</p> <p>Performance Objectives:</p> <ul style="list-style-type: none"> <li>• Maintain the soil productivity of the site;</li> <li>• Protect off-site areas by preventing accelerated soil erosion (such as land sliding, gullying, rilling, piping, etc.) from occurring;</li> <li>• Protect water quality and quantity of adjacent surface and groundwater sources;</li> <li>• Select the best possible site for development in order to prevent impacts to the soil and water resources.</li> </ul> <p><b>Exception:</b> None<br/> <b>Modification:</b> None<br/> <b>Waiver:</b> None</p>        |
| <b>UT-S-125</b> | <p style="text-align: center;"><b>NO SURFACE OCCUPANCY – RIPARIAN ZONES</b></p> <p>No surface occupancy within riparian zones within the Dixie Resource. No surface occupancy restrictions would protect important biological components and habitats of resident and migratory species listed under the Endangered Species Act or otherwise at risk from declining habitat quality or availability. For the protection of impoundments and streams, and/or riparian wetland vegetation zones, activities associated with oil and gas exploration and development, including roads, transmission lines, and storage facilities, are restricted to an area beyond the riparian vegetation zone</p> <p><b>Exception:</b> The authorized officer may grant an exception for roads, pipelines, or power lines if there is no practical alternative route and mitigation can be applied to reduce impacts to a satisfactory level.</p> <p><b>Modification:</b> None<br/> <b>Waiver:</b> None</p> |
| <b>UT-S-241</b> | <p style="text-align: center;"><b>TIMING LIMITATION – CRUCIAL WINTER RANGE MULE DEER</b></p> <p>No development activity is allowed from November 1 through April 15 within crucial mule deer winter range. This area encompasses mule deer</p>  |

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|          | <p>winter range designated as crucial by the Utah Division of Wildlife Resources.</p> <p><b>Exceptions:</b></p> <ol style="list-style-type: none"> <li>1. The Authorized Officer may grant an exception if an environmental analysis indicates the proposed action could be conditioned so as not to interfere with habitat function or compromise animal condition with the project vicinity.</li> <li>2. An exception may be granted if the proponent, BLM, and Utah DWR negotiate compensation that would satisfactorily offset anticipated impacts to mule deer winter activities or habitat condition.</li> <li>3. Under mild winter conditions, when prevailing habitat or weather conditions allow early dispersal of animals from all or portions of the project area, an exception may be granted to suspend no more than the last 60 days of this seasonal limitation. Severity of winter will be determined on the basis of snow depth, snow crusting, daily mean temperatures, and whether animals were concentrated on the winter range during the winter months.</li> <li>4. Exceptions may also be granted for actions specifically intended to enhance the long- term utility or availability of suitable habitat.</li> </ol> <p><b>Modifications:</b></p> <ol style="list-style-type: none"> <li>1. The Authorized Officer may modify the size and timeframes of this stipulation if Utah DWR monitoring information indicates current animal use patterns are no longer consistent with dates established for animal occupation.</li> <li>2. Modifications may be authorized if the proposed action could be conditioned so as not to interfere with habitat function or compromise animal condition.</li> <li>3. The limitation may be modified if the proponent, BLM, and Utah DWR agree to habitat compensation which satisfactorily offsets detrimental impacts to activity and habitat condition.</li> </ol> <p><b>Waiver:</b> This stipulation may be waived to the extent the Utah DWR determines that all or specific portions of the area no longer constitute real or prospective critical deer winter range.</p> |
| UT-S-289 | <p><b>TIMING LIMITATION – MEXICAN SPOTTED OWL NEST SITES</b></p> <p>No development is allowed within 0.5 mile of identified nests from February 1 to August 31, or until the fledging and dispersal of the young.</p> <p><b>Exception</b> (after FWS consultation):</p> <ol style="list-style-type: none"> <li>1. An exception may be granted if an environmental analysis of the proposed action indicates the nature or conduct of the activity could be conditioned so as to not impair the utility of the nest for current or subsequent nesting activity or occupancy.</li> <li>2. An exception may be granted if the nest is unattended or remains unoccupied by May 15 of the project year.</li> </ol> <p><b>Modification</b> (after FWS consultation):</p> <ol style="list-style-type: none"> <li>1. The Authorized Officer may modify the size of the stipulation area if</li> </ol>   |

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|  | <p>an environmental analysis indicates that a portion of the area is nonessential to nest utility or function.</p> <p>2. The Authorized Officer may modify the size of the stipulation area if the proposed action could be conditioned so as not to impair the utility of the nest site for current or subsequent nest activities or occupation.</p> <p><b>Waiver</b> (after FWS consultation): A waiver may be granted if there is no reasonable likelihood of site occupation over a minimum 10-year period.</p> |
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## LEASE NOTICES SUMMARY

|                 |   |
|-----------------|---|
| <b>UT-LN-40</b> | <p style="text-align: center;"><b>GOLDEN EAGLE HABITAT</b></p> <p>The lessee/operator is given notice that lands in this lease have been identified as containing Golden Eagle Habitat. Modifications to the Surface Use Plan of Operations may be required in order to protect the Golden Eagle and/or habitat from surface disturbing activities in accordance with Section 6 of the lease terms, Endangered Species Act, and 43 CFR 3101.1-2.</p>  |
| <b>UT-LN-44</b> | <p style="text-align: center;"><b>RAPTORS</b></p> <p>Appropriate seasonal and spatial buffers shall be placed on all known raptor nests in accordance with Utah Field Office Guidelines for Raptor Protection from Human and Land use Disturbances (USFWS 2002) and Best Management Practices for Raptors and their Associated Habitats in Utah (BLM 2006). All construction related activities will not occur within these buffers if pre-construction monitoring indicates the nests are active, unless a site-specific evaluation for active nests is completed prior to construction and if a BLM wildlife biologist, in consultation with USFWS and UDWR, recommends that activities may be permitted within the buffer. The BLM will coordinate with the USFWS and UDWR and have a recommendation within 3-5 days of notification. Any construction activities authorized within a protective (spatial and seasonal) buffer for raptors will require an on-site monitor. Any indication that activities are adversely affecting the raptor and/or its' young the on-site monitor will suspend activities and contact the BLM Authorized Officer immediately. Construction may occur within the buffers of inactive nests. Construction activities may commence once monitoring of the active nest site determines that fledglings have left the nest and are no longer dependent on the nest site. Modifications to the Surface Use Plan of Operations may be required in accordance with section 6 of the lease terms and 43CFR3101.1-2.</p> |
| <b>UT-LN-45</b> | <p style="text-align: center;"><b>MIGRATORY BIRD</b></p> <p>The lessee/operator is given notice that surveys for nesting migratory birds may be required during migratory bird breeding season whenever surface disturbances and/or occupancy is proposed in association with fluid mineral exploration and development within priority habitats. Surveys should focus on identified priority bird species in Utah. Field surveys will be conducted as determined by the authorized officer of the Bureau of Land Management. Based on the result of the field survey, the authorized officer will determine appropriate buffers and timing</p>   |

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|------------------|--|--|
|                  | limitations.   |  |
| <b>UT-LN-68</b>  | <p align="center"><b>NOTIFICATION &amp; CONSULTATION REGARDING CULTURAL RESOURCES</b></p> <p>The lease area may now or hereafter be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), the Archaeological Resources Protections Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), other statues and Executive Order 13007, and which may be of concern to Native American tribes, interested parties, and the State Historic Preservation Officer (SHPO). BLM will not approve any ground disturbing activities as part of future lease operations until it completes applicable requirements of the National Historic Preservation Act (NHPA), including the completion of any required procedure for notification and consultation with appropriate tribe(s) and/or the SHPO. BLM may require modifications to exploration and development proposals to further its conservation and management objectives on BLM-approved activities that are determine to affect or impact historic or cultural properties and/or resources.</p> |  |
| <b>UT-LN-93</b>  | <p align="center"><b>RESERVOIRS AND PERENNIAL STREAMS</b></p> <p>To protect reservoirs and perennial streams from unnecessary pollution and sedimentation, 43 CFR 3101.1-2 (the 200 meter rule) will be applied to prevent surface disturbance within 100 yards of the high water line of permanent water bodies.</p>  |  |
| <b>UT-LN-95</b>  | <p align="center"><b>RIPARIAN AND RIPARIAN-RELATED RESOURCES</b></p> <p>43 CFR 3101.1-2 allows the Authorized Officer to require activities to be moved up to 200 meters to protect specific resources. The authorized officer may apply this regulation adjacent to riparian zones where site-specific analysis shows a need to further protect riparian- related resources including Southwest willow flycatcher habitat and nesting sites.</p>  |  |
| <b>UT-LN-99</b>  | <p align="center"><b>REGIONAL OZONE FORMATION CONTROLS</b></p> <p>To mitigate any potential impact oil and gas development emissions may have on regional ozone formation, the following Best Management Practices (BMPs) would be required for any development projects:</p> <ul style="list-style-type: none"> <li>• Tier II or better drilling rig engines</li> <li>• Stationary internal combustion engine standard of 2g NOx/bhp-hr for engines &lt;300HP and 1g NOx/bhp-hr for engines &gt;300HP</li> <li>• Low bleed or no bleed pneumatic pump valves</li> <li>• Dehydrator VOC emission controls to +95% efficiency</li> </ul> <p>Tank VOC emission controls to +95% efficiency</p>   |  |
|                  |  |  |
| <b>UT-LN-102</b> | <p align="center"><b>AIR QUALITY ANALYSIS</b></p> <p>The lessee/operator is given notice that prior to project-specific approval, additional air quality analyses may be required to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include dispersion modeling and/or</p>  |  |

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|  | photochemical modeling for deposition and visibility impacts analysis, control equipment determinations, and/or emission inventory development. These analyses may result in the imposition of additional project-specific air quality control measures. |
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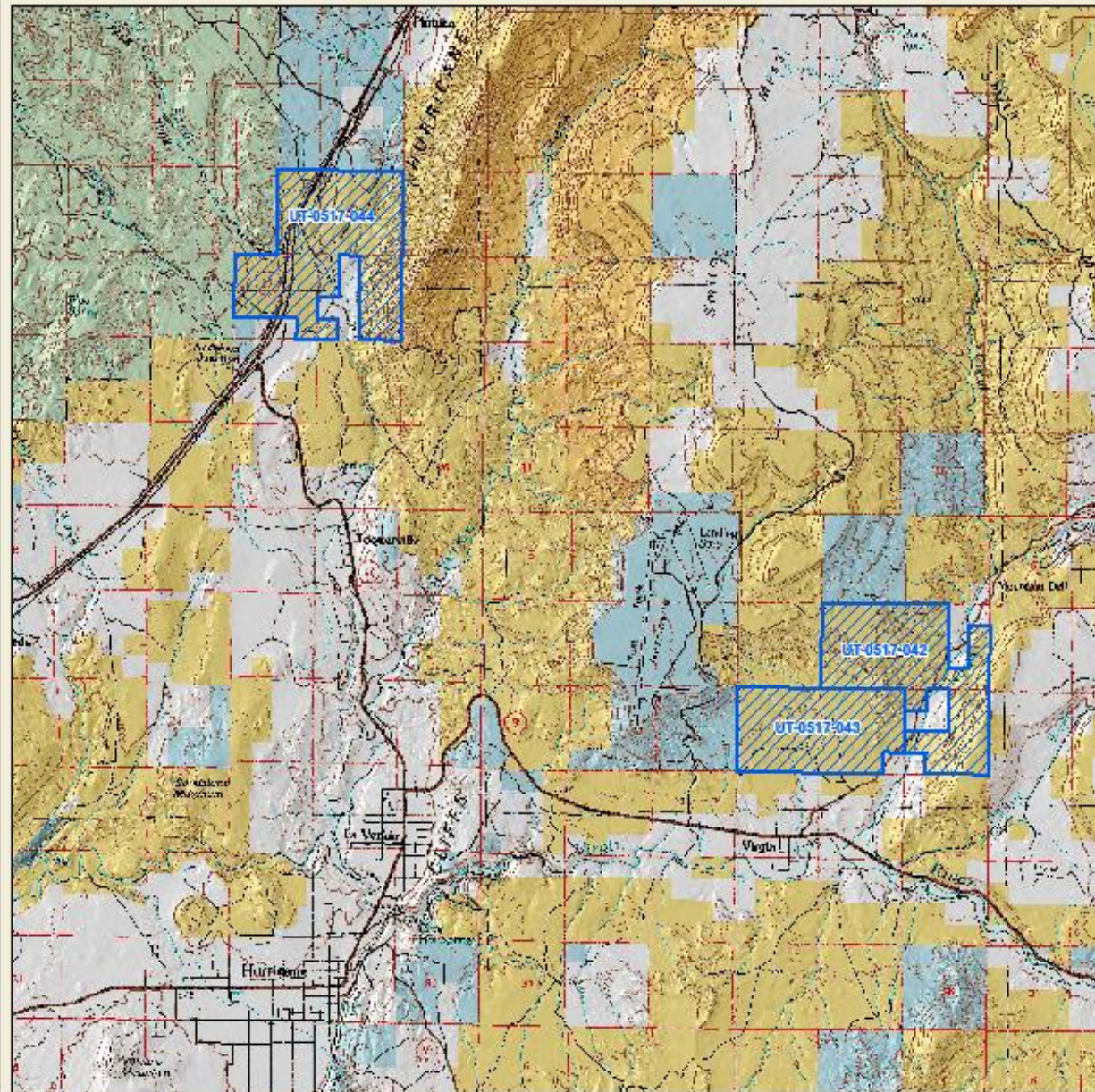
## APPENDIX B, LEASE PARCELS MAP

### Fluid Mineral Lease Parcels

St. George Field Office  
10/6/2016

No warranty is made by the BLM for use of the data for purposes not intended by the BLM.

This product may not meet BLM standards for accuracy and content. Different data sources and input scales may cause some misalignment of data layers.



Location within St. George Field Office



0 1.5 3 Miles

- |                                 |  |
|---------------------------------|--|
| Parcel Boundaries               | State                                  |
| BLM Wilderness Area             | State Wildlife Reserve/Management Area |
| Bureau of Land Management (BLM) | US Forest Service (USFS)               |
| Private                         |  |

## APPENDIX C, DEFERRED PARCEL LIST

| Parcel Number  | Legal Description   | Acres  | Reason Tract Postponed  |
|--|---|--------|---|
| UT0517 – 045<br>Washington County, Utah. St. George Field Office | T. 40 S., R. 13 W., Salt Lake. Sec. 29: S2; Sec. 31: Lots 1-4, NE, E2NW, NESW | 825.32 | <p>(1) Section 106 and potential Tribal concerns were factors influencing the decision to defer parcel UT-0517-045. The known site densities in the southwest section of the lease parcel are very high and consist of prehistoric campsites, prehistoric agave processing sites, and portions of the historic towns of Silver Reef and Bonanza that were associated with the Silver Reef mining area. Much of the parcel covered in active aeolian deposits so additional buried sites may be likely. No survey has been completed in the northwest section of the parcel. However, proximity and similar environmental circumstances suggest that site nature and densities would be similar to those found in the southwest section.</p> <p>Given the known and expected density and nature of sites throughout UT-0517-045, it would make it difficult for reasonably foreseeable development (which the BLM defines as one 5-acre well pad per parcel) to occur without adversely affecting sites. Consistent with 36 CFR 800.5(a)(2), visual and atmospheric effects must also be taken into account. Inclusion of this parcel in the overall lease sale would require a finding of an adverse effect to historic properties in Section 106 consultation. Per 36 CFR 800.6, a process, including the preparation of a memorandum of agreement, would need to be completed to mitigate these effects prior to finalizing a NEPA document or executing the undertaking.</p> <p>In addition, the southwest parcel was previously considered by the SGFO for disposal. The parcel was withdrawn because of cultural resources densities and consultation with the Paiute indicated that it was an area that had significant traditional, cultural, and sacred values for them.</p> <p>(2) Proximity to the town of Leeds/Silver Reef, associated private residences</p> |

## APPENDIX D, INTERDISCIPLINARY TEAM CHECKLIST

### INTERDISCIPLINARY TEAM CHECKLIST

**Project Title:** St. George Field Office Oil and Gas Lease Sale

**NEPA Log Number:** DOI-BLM-UT-C030-2017-0010--EA

**Project Leader:** Dave Corry

**DETERMINATION OF STAFF:** *(Choose one of the following abbreviated options for the left column)*

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

| Determination  | Resource    | Rationale for Determination*   | Signature    | Date |
|--|-------------|--|--------------|------|
| <b>RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES<br/>APPENDIX 1 H-1790-1)</b> |             |  |              |      |
| PI   | Air Quality | The act of leasing does not result in emissions of air pollutants, so has no impact on air resources. If a lease parcel is sold and developed, the construction and operation of oil and gas wells would result in emissions of criteria pollutants which would need to be appropriately analyzed in any subsequent NEPA once specific devolvement plans are presented. A representative emissions inventory for a single well should be included in the EA to disclose the types and likely amounts of emissions which could result from development of the parcel. | Leonard Herr |      |



| Determination | Resource  | Rationale for Determination*  | Signature               | Date              |
|---------------|---|---|-------------------------|-------------------|
| NP            | Areas of Critical Environmental Concern             |   | D. Corry                | 9/6/16            |
| NP            | BLM Natural Areas                                   | There are no BLM Natural Areas within the St. George Field Office   | D. Kiel                 | 10/04/16          |
| PI            | Cultural Resources                                  | Effects to sites eligible for the National Register of Historic Places will need to be determined using the identification efforts consistent with direction provided by the Utah State Office. The BLM will need to consult with the Utah SHPO regarding a determination of effect.  | Lori Hunsaker/G. McEwen | 9/9/16            |
| PI            | Greenhouse Gas Emissions                            | It is unlikely project-specific impacts would be able to be determined from likely amounts of GHG's from lease development. A qualitative description of climate change impacts should be included in the EA.   | Leonard Herr            |                   |
| NI            | Environmental Justice                               | Minority, low income populations and disadvantaged groups may be present within the counties involved in this lease sale. Leasing would not adversely or disproportionately affect minority, low income or disadvantaged groups.  | D. Corry                | 9/6/16            |
| NP            | Farmlands (Prime or Unique)                         | None of the identified parcels qualify as prime or unique farmlands according to the NRCS Soil Survey of the Washington County Area.  | D. Corry                | 9/6/16            |
| PI            | Fish and Wildlife Excluding USFW Designated Species | All four parcels proposed for lease are located in Crucial Mule Deer Winter Range as specified by Utah Division of Wildlife Resources. The SGFO RMP (1999, Page 2.24) specifies that crucial mile deer winter range will be protected from the potential effects of fluid mineral leasing with a Category 2 seasonal stipulation to close the land to exploration or development from | B. Douglas/D. Corry     | 9/7/16<br>10/5/16 |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>November 1 to April 15.</p> <p>See UT-S-241, Appendix A</p> <p>The following BLM Sensitive species may occur in the project area: Arizona toad (permanent resident, fairly common), Great Plains toad (permanent resident, fairly common), bald eagle (winter visitor, fairly common), burrowing owl (permanent resident, uncommon), ferruginous hawk (permanent resident, fairly common), Lewis's woodpecker (permanent resident, rare), Northern goshawk (permanent resident, rare), short-eared owl (transient, rare), Allen's big-eared bat (permanent resident, extremely rare), big- free-tailed bat (summer resident, rare), fringed myotis (permanent resident, uncommon), kit fox (permanent resident, uncommon), spotted bat (permanent resident, rare), Townsend's big-eared bat (permanent resident, fairly common), Western red bat (permanent resident, extremely rare), desert sucker (permanent resident, fairly common), flannel-mouth sucker (permanent resident, fairly common), Virgin spinedace (permanent resident, fairly common), common chuckwalla (permanent resident, uncommon), gila monster (permanent resident, rare), sidewinder (permanent resident, fairly common), Western banded gecko (permanent resident, uncommon), Western threadsnake (permanent resident, rare) and zebra-tailed lizard (permanent resident, fairly common). Desert suckers, Virgin spinedace and flannel-mouth sucker all occur in North Creek and are fairly abundant. These three species occur also in Ash Creek, however, only desert</p> |           |      |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>sucker occurs in the upper reach on the Oil and Gas parcel and only during the spring when there are flows in the stream. General wildlife found in the project area include: badgers, antelope ground squirrels, kangaroo rats, deer mice, desert wood rats, wild turkey, chukar, Gambel's quail, mourning doves, common ravens, wrens, house finches, side-blotched lizards, and Western whiptails. Infrequently, larger animals such as raptors, coyotes, gray fox, and mule deer may pass through the area. Three out of the 4 proposed oil and gas parcels UT0517-042 (North Creek), UT0517-044 (Ash Creek), and UT0517-045 (Grapevine Wash) contain riparian habitat. In 1999, the St. George Resource Management Plan (BLM 1999) classified these parcels as "Open" to oil and gas leasing, with No Surface Occupancy (NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development.</p> <p>Potential impacts to BLM Sensitive, and general wildlife species occurring from oil and gas exploration and development may vary greatly depending on which parcel is developed, what habitats are disturbed (black brush supports less wildlife species and lower densities of those species than does pinyon/juniper habitat), and the season of the year the work is completed. Each site would be different with varying amounts of access road required, drill pad size (due to slope), soil texture and the extent of drilling. Special stipulations or best management practices (BMP) could lessen overall direct and indirect</p> |           |      |

| <b>Determination</b> | <b>Resource</b>       | <b>Rationale for Determination*</b>  | <b>Signature</b> | <b>Date</b> |
|----------------------|-----------------------|--|------------------|-------------|
|                      |                       | <p>impacts to BLM Sensitive and general wildlife species.</p> <p>General impacts during the exploration phase may include: 1) during construction of access roads, drill pads and the drilling operation, small mammals, reptiles, amphibians, and birds maybe disturbed and/or killed, and their nests, or dens destroyed causing short-term impacts, 2) during the construction activities, larger and more mobil animals maybe disturbed and/or displaced to adjacent habitats causing short-term impacts, and 3) impacts to BLM Sensitive and general wildlife species would be significantly higher if surface disturbances occurred adjacent to riparian habitats, on steeper sloping habitats, or on fragile and erodible soils.</p> <p>General impacts during the development phase may include: 1) permanent roads would be maintained, and facilities built to facilitate production causing a loss of general terrestrial habitat in the area, 2) if roads are allowed to stay open to the public, additional disturbances would result from increased traffic on roads, and 3) operation of wells my result in a “noise factor” which may disturb BLM Sensitive and general wildlife species in adjacent habitats.</p> |                  |             |
| NI                   | Floodplains           | Leasing activities would not have an impact on floodplains. If development is proposed, actions should be analyzed in a separate NEPA document to determine if any impacts to floodplains exist.   | D. Corry         | 9/6/16      |
| NI                   | Fuels/Fire Management | Leasing activities would have no impact on Fuels/Fire Management.  | D. Corry         | 9/6/16      |

| <b>Determination</b> | <b>Resource</b>                               | <b>Rationale for Determination*</b>  | <b>Signature</b> | <b>Date</b> |
|----------------------|---|--|------------------|-------------|
| NI                   | Geology / Mineral Resources/Energy Production | It is likely that there several mineral claims on the proposed parcels. Prior to any ground disturbing activities a mining claim search should be conducted. Any conflicts between fluid mineral operations and other mineral operations would be resolved prior to any fluid mineral exploration and development.   | D. Corry         | 9/6/16      |
| NI                   | Hydrologic Conditions                         | See Water Resource/Quality   | D. Corry         | 9/6/16      |
| NI                   | Invasive Species/Noxious Weeds                | Leasing activities would not impact Invasive Species/Noxious Weeds. A revegetation plan and Noxious Weed/Invasive Species prevention and control plan should be outlined and in place before any ground disturbing activities are conducted.   | R. Reese         | 9/7/16      |
| NI                   | Lands/Accesses                                | The proposed action would not substantially affect access to public land on a permanent basis. No roads providing access to public land would be closed for any extended period of time. The proposal would be subject to valid prior existing rights including county-maintained roads (See BLM internal/public Master Title Plat web site as there are various rights-of-way in the proposed parcels). Any operations would need to be coordinated with right-of-way (ROW) holders and adjacent non-federal landowners. Off-lease ancillary facilities that cross public land, if any, may require a separate authorization (Generally Access Roads and utility ROWs). It is anticipated that existing ROWs in proposed operation areas would not be affected because site-specific mitigation applied at the Application for Permit to Drill (APD) stage, including the ability to move operations up to 200 meters in any direction is typically required. These measures would ensure that existing ROWs would be avoided, restored, or | K. Thomas        | 9/12/16     |

| <b>Determination</b> | <b>Resource</b>   | <b>Rationale for Determination*</b>  | <b>Signature</b> | <b>Date</b> |
|----------------------|-------------------|--|------------------|-------------|
|                      |                   | replaced if damaged. Seasonal route restrictions should also be dealt with through site-specific mitigation on an as-needed basis. Surface disturbance within and outside described project areas would need to be rehabilitated and reseeded on a site-specific basis as directed by authorizing BLM officials. Plans should be made for removal of any generated trash/debris from public land and discarded at an authorized facility.  |                  |             |
| NI                   | Livestock Grazing | Leasing activities should not impact Livestock Grazing. Those parcels located within active livestock use allotments may need to be evaluated once the amount of surface disturbance that will take place is established.  | R. Reese         | 9/7/16      |
| PI                   | Migratory Birds.  | For a list of birds protected by the Migratory Bird Treaty Act, see Appendix D, and a list of Birds of Conservation Concern (USFWS 2008) occurring in Washington County, Utah, see Appendix E. Potential impacts to migratory bird species occurring from oil and gas exploration and development may include: 1) during exploration and development surface disturbing activities, migratory birds maybe disturbed and/or killed, and their nests destroyed causing short-term impacts, 2) during exploration and development surface disturbing activities, migratory birds maybe disturbed and displaced to adjacent habitats causing short-term impacts, but would return to these areas once disturbances ceased, 3) during development of oil and gas, any permanent roads or facilities established would cause a loss of general terrestrial habitat for migratory birds in the long term, and 4) any permanent roads (if open to the public) or permanent | B. Douglas       | 10/5/16     |

| Determination | Resource                           | Rationale for Determination*  | Signature               | Date   |
|---------------|------------------------------------|---|-------------------------|--------|
|               |                                    | <p>facilities (with permanent noise) may affect nesting and non-nesting birds through long-term disturbances.</p> <p>The following conservation measures for protection of raptors and other migratory birds are recommended:</p> <ul style="list-style-type: none"> <li>• Activities would comply with Utah BLM BMPs for Raptors and Their Associated Habitats in Utah.</li> <li>• Project activities would not occur within recommended spatial and seasonal buffers for raptors, unless otherwise approved. If existing topography limits line-of-sight between an active nest and construction activities, spatial and seasonal buffers may be reduced.</li> <li>• Construction activities would be limited during the migratory bird nesting period (February 1 to August 15) or a migratory bird nesting survey would be completed in areas proposed for disturbance during this time period.</li> </ul> <p>Should an active migratory bird nest be discovered, the appropriate agency biologist would be notified and an appropriate buffer established around the nest until the migratory bird nesting period is over or young have fledged.</p> |                         |        |
| PI            | Native American Religious Concerns | The BLM will need to consult with Federally recognized to determine if this undertaking will affect sites of religious and cultural significance.   | Lori Hunsaker/G. McEwen | 9/9/16 |
| NI            | Paleontology                       | The granting of this lease will have no impact on Paleontological resources; should ground disturbances be planned, survey maps should be reviewed to ensure no resources are located   | R. Reese                | 9/7/16 |

| <b>Determination</b> | <b>Resource</b>            | <b>Rationale for Determination*</b>  | <b>Signature</b> | <b>Date</b> |
|----------------------|----------------------------|--|------------------|-------------|
|                      |                            | within the project area.   |                  |             |
| NI                   | Rangeland Health Standards | Leasing activities would not have an impact on rangeland health. If future development is proposed, the actions could impact the health of the surrounding rangeland; these actions should be analyzed in a separate NEPA document at the time of the proposed development.  | R. Reese         | 9/7/16      |
| PI                   | Recreation                 | <p>All of the proposed lease parcels are used for dispersed recreation activities, primarily hiking, hunting, and other human powered pursuits. It is difficult to quantify impacts to dispersed recreation, but it is safe to say that those parcels with nearby housing developments receive the most use and those individuals would be displaced by any development activities.</p> <p>The Flying Monkey mountain bike trail is within parcels UT-0517-042 and UT-0517-043. This is an expert only, double black diamond, downhill specific trail.</p>   | D. Kiel          | 10/4/16     |
| PI                   | Socio-Economics            | Washington County's population totaled 144,809 in 2012, with the City of St. George accounting for 52.2% of this total. Population growth has far outpaced that of Utah and the United States as a whole, although the County's population growth has slowed somewhat recently compared to previous decades. The population is 93.9% white, which is slightly higher than the state-wide percentage. Over 18% of the population is aged 65 or older, which is twice the percentage for all other counties in the state, and appears to reflect the popularity of greater St. George area as a retirement destination. Approximately 91% of the population age 25 | D. Kiel          | 10/5/16     |



| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>and over have a high school education or higher, with over 25% of the population holding an undergraduate degree or higher.</p> <p>As of 2012, annual per capita personal income in Washington County was \$28,597, which is lower than the statewide estimate of \$35,430. Of the Washington County total, approximately \$13,976 (48.9%) represents non-labor income, which is considerably higher than the State of Utah or U.S. national average. This may reflect the significantly higher percentage of older and retired residents who live in the County. Unemployment averaged 7% for 2012, although the seasonally adjusted rate had dropped to 5.3% by October, 2013. The percentage of the population living at or below the poverty level averaged 14.5% over the period between 2008 and 2012, somewhat higher than the state average of 12.1%.</p> <p>The social and economic environments of Washington County would be positively affected by the proposed project. Exploratory drilling of oil and gas in the project area would contribute to the local economy by providing several benefits: short-term employment opportunities for construction, drilling and completion; monies to local contractors; and revenues recycled into the area's local economy. Additional revenues would be generated in the form of sales taxes and income taxes. Local workers would potentially be used in much of the project work, and they would likely spend much of their income in local economies, thus producing a "multiplier effect" that could be</p> |           |      |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>at least 1.5 times the revenues generated from the proposed project.</p> <p>The Proposed Action would add to the short-term opportunities for employment in Washington County, especially for workers associated with the support of the oil and gas industry. The average cost to construct, drill and complete an individual well is approximately \$5,000,000 if four wells were drilled the economic impact would be approximately \$20,000,000.</p> <p>If the proposed well is productive, long-term employment opportunities would likely be generated for at least one pumper and three tanker truck drivers. If the well is productive, income to the federal government, State of Utah and Washington County would be generated in the form of royalties, sales taxes, income taxes, and property taxes for the producing well. Furthermore, if the well is productive, field development would likely be pursued by the applicant, thereby potentially resulting in additional short-term and long-term employment opportunities, royalties, sales taxes, income taxes, and property taxes.</p> <p>If production is established from a well and/or additional wells, the development of oil and gas could lead to long-term impacts to the social structure of the communities, changes in the economic base, and an increased demand for local government services. These impacts could include increased revenues in the local economy, an increase in the tax base, change in the social structure of the local community, and increased demand for community services and strain on the</p> |           |      |

| Determination | Resource | Rationale for Determination*   | Signature | Date   |
|---------------|----------|--|-----------|--------|
|               |          | <p>infrastructure (schools, hospitals, law enforcement, fire protection, and other community needs). These possible social and economic changes are beyond the scope of this document and to make those projections would be speculative at best.</p> <p>Negative socioeconomic impacts may also stem from oil and gas exploration and development activities. These impacts are difficult to quantify accurately due to complex interactions, feedback loops, changing and unknown parameters. Adverse social and economic consequences for areas adjacent to rapid oil and gas development might include, for example, higher costs of living and decreases in recreational tourism revenue. While such impacts may occur, accurate valuation is not currently possible in a predictive capacity and, given the scale of the Proposed Action (four wells drilled); negative impacts of even a moderate degree should not be anticipated.</p> |           |        |
| NI            | Soils    | <p>Leasing would not have an impact on these resources; however there is a possibility that exploration/development could occur in the future. If exploration/development is proposed, these actions could have impacts to soils and watersheds and these actions would be analyzed in separate NEPA documents at the time of the proposal. SOPs, BMPs and site specific design features including reclamation would be applied at the APD stage as COAs to mitigate soil disturbing actions on soils and watersheds.</p> <p>The application of stipulation UT-S-107</p>   | D. Corry  | 9/6/16 |

| Determination | Resource   | Rationale for Determination*   | Signature           | Date    |
|---------------|--|--|---------------------|---------|
|               |  | <p>(Appendix A) is warranted on all parcels.</p> <p>UT-S-107: Controlled surface use on severely erodible soils as mapped, on slopes equal to or greater than 25 percent. Prior to surface disturbance of fragile soils, it must be demonstrated to the Authorized Officer through a plan of development that the follow performance objectives will be met.</p> <p>Performance Objectives:</p> <ul style="list-style-type: none"> <li>• Maintain the soil productivity of the site;</li> <li>• Protect off-site areas by preventing accelerated soil erosion (such as land sliding, gullyng, rilling, piping, etc.) from occurring;</li> <li>• Protect water quality and quantity of adjacent surface and groundwater sources;</li> <li>• Select the best possible site for development in order to prevent impacts to the soil and water resources.</li> </ul> |                     |         |
| NP            | Threatened, Endangered or Candidate Plant Species  | No threatened, endangered or candidate plant species are known to occur in the project area.   | B. Douglas          | 10/5/16 |
| PI            | Threatened, Endangered or Candidate Animal Species | <p>Four federally listed species were determined to have the potential to occur in the Project Area: California condor, Mexican spotted owl, Southwestern willow flycatcher and Western yellow-billed cuckoo.</p> <p><b>California Condor (<i>Gymnogyps californianus</i>) –10(j) Non-Essential</b></p>  | J. Kellam/B Douglas | 10/5/16 |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p><b>Experimental Population</b></p> <p>The California condor was listed federally endangered on March 11, 1967 and noted to only occur in California (USFWS 1976). By 1987, the last wild condor was captured and taken to the San Diego Wild Animal Park (USFWS 1996). Beginning with the first successful breeding of California condors in 1988, the population grew to 121 in 1996, including 104 in the captive flock, and 17 in the wild (USFWS 1996).</p> <p>On October 16, 1996, the USFWS announced plans to reintroduce California condors into northern Arizona and designate these birds as non-essential experimental populations, as provided by Section 10j of the ESA (USFWS 1996). California condors from the experimental population area (USFWS 1996) frequently forage away from the Vermillion Cliffs of Arizona into southwestern Utah, including Washington County. Most California condor use occurs east of the project area near Zion National Park and no nests, roosts, or other special use areas for condors have been identified in the Project Area.</p> <p>Under the requirements of NEPA, when a proposed action may potentially affect the California condor 10(j) non-essential experimental population, the 10(j) population should be addressed (and their status defined), and then not carried forward for further analysis within the NEPA document.</p> <p><b>Mexican Spotted Owl</b></p> |           |      |

| Determination | Resource | Rationale for Determination*  | Signature | Date |
|---------------|----------|---|-----------|------|
|               |          | <p>The Mexican spotted owl (<i>Strix occidentalis lucida</i>) (MSO) was listed as threatened under the ESA on March 16, 1993 (58 FR 14248). The species listing was a result of declining population numbers attributed to habitat loss. Critical habitat was originally designated on June 6, 1995 (60 FR 29913), but was revoked and re-designated in 2001 (65 FR 8530). It was revoked again, and finally re-designated in 2004 (69 FR 53181). A recovery plan for the MSO was approved on October 16, 1995. The MSO ranges from British Columbia to Mexico along a corridor that includes western Utah and a portion of the project area. They nest in steep canyon areas in a variety of mixed forest types (Ehrlich et al. 1988). They will nest in trees, tree cavities, and cliff faces. MSOs do not build their own nests, but utilize nests that have been built by other bird species. Their diet consists mainly of rodents, but they will also eat rabbits, birds, lizards and other small vertebrates. They will brood up to four eggs, which will hatch in 28 to 32 days. The young are cared for by both parents, and are fledged in 34 to 36 days (Gutierrez 1995).</p> <p>Three out of the 4 proposed Oil and Gas Parcels UT0517-042 (North Creek), UT0517-043 (Virgin Town), and UT0517-044 (Ash Creek) are located on the western border of MSO designated critical habitat. These parcels have sagebrush, black brush and other desert shrubs at their lower elevations, with mixed desert shrub and scattered pinyon and juniper trees at higher elevations. There is several large cliffs and talus slopes in these parcels, however, the lack of suitable nesting substrates ( no walled canyons) and habitat</p> |           |      |

| Determination | Resource | Rationale for Determination*  | Signature | Date |
|---------------|----------|---|-----------|------|
|               |          | <p>structure (open and sparsely vegetated) associated with these sites does not provide suitable nesting habitat. There are no protected activity centers (PACs) near these parcels that would be impacted by future oil and gas development. No MSO or their sign have been observed in the past and no special use areas have been identified. These parcels provide opportunities to MSO as foraging and dispersal habitat.</p> <p>Direct or indirect impacts to the MSO are unlikely because the Project is located in marginally suitable habitat for this species. The above mentioned parcels are on the edge of designated critical habitat which is potentially foraging and dispersal habitat. No significant direct or indirect impacts to MSOs are anticipated. The proposed project “may affect, but would not likely adversely affect” MSOs.</p> <p>See stipulation UT-S-289, Appendix A</p> <p><b>Southwestern Willow Flycatcher</b></p> <p>Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>) (SWIFL) was listed federally endangered in 1995 (USFWS 1995a). Here in Washington County, the SWIFL received additional protection when critical habitat was designated along the Virgin River from Hurricane Bridge (Hwy 9) to the Utah/Arizona Stateline (USFWS 2013). A recovery plan for SWIFL was developed by USFWS, other federal and state agencies, and interest groups in 2002 (USFWS 2002). The SWIFL primarily breeds in the southwestern</p> |           |      |

| Determination | Resource | Rationale for Determination*  | Signature | Date |
|---------------|----------|---|-----------|------|
|               |          | <p>United States and winters in Central America and southern Mexico (USFWS 2002). In Utah, the SWIFL is found in the southern portion of the state in riparian habitats where dense growth of willows (<i>Salix</i> spp.), cottonwood (<i>Populus</i> spp.) and other riparian plants occur. The SWIFL eats insects, seeds, and berries. Breeding occurs during late spring or early summer, with peak breeding activity occurring in June. Large scale losses of southwestern wetlands have occurred, particularly the cottonwood-willow riparian habitats of the SWIFL from urban and agricultural development, water diversion, and impoundment, channelization, livestock grazing, off-road vehicle and other recreation uses, and hydrological changes resulting from these and other land uses (USFWS 1995a).</p> <p>Three out of the 4 proposed oil and gas parcels UT0517-042 (North Creek), UT0517-044 (Ash Creek), and UT0517-045 (Grapevine Wash) contain riparian habitat. In 1999, the St. George Resource Management Plan (BLM 1999) classified these parcels as “Open” to oil and gas leasing, with No Surface Occupancy (NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development. Each of these riparian area within the project area was field checked (see attach survey sheets) and determined to be unsuitable for SWIFL nesting; however, these riparian areas do provide opportunities for SWIFLs during migration (stop over habitat). The NSO classification should provide protection to riparian areas and provide opportunities for</p> |           |      |



| Determination | Resource | Rationale for Determination*  | Signature | Date |
|---------------|----------|---|-----------|------|
|               |          | <p>potential migrating SWIFLs. No significant direct or indirect impacts to SWIFLs are anticipated. The proposed project “may affect, but would not likely adversely affect” SWIFLs.</p> <p><b>Western Yellow-billed Cuckoo</b></p> <p>The Western Yellow-billed Cuckoo (<i>Coccyzus americanus occidentalis</i>) (cuckoo) was listed as a threatened species (USFWS 2014) due to declining populations attributed to habitat loss, degradation and fragmentation. Cuckoos are considered a riparian obligate and are usually found in large tracts of dense cottonwood or willow habitats, below 33 ft. in height (UDWR 2010b). Population status and trends within Washington County are unknown, however, birds have been observed along the Virgin River and some tributaries. Cuckoo nesting behavior may be closely tied to food abundance. In years of low food abundance, cuckoos may forego nesting. Cuckoos are one of the latest migrants to arrive and breed in Utah. They arrive in late May or early June and breed in late June through July (Parrish et. al. 2002). Nesting habitat is classified as dense lowland riparian characterized by a dense sub-canopy or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) within 300 feet of water (UDWR 2010b). Cuckoos typically start their southerly migration by late August or early September. Yellow-billed cuckoos feed almost entirely on large insects that they glean from tree and shrub foliage. They feed primarily on caterpillars, including tent caterpillars. They also feed frequently on</p> |           |      |

| <b>Determination</b> | <b>Resource</b>                         | <b>Rationale for Determination*</b>   | <b>Signature</b> | <b>Date</b> |
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|                      |   | <p>grasshoppers, cicadas, beetles, and katydids, occasionally on lizards, frogs, and eggs of other birds, and rarely on berries and fruits (UDWR 2010b).</p> <p>Three out of the 4 proposed oil and gas parcels UT0517-042 (North Creek), UT0517-044 (Ash Creek), and UT0517-045 (Grapevine Wash) contain riparian habitat. In 1999, the St. George Resource Management Plan (BLM 1999) classified these parcels as “Open” to oil and gas leasing, with No Surface Occupancy (NSO) on riparian habitat. The NSO classification will provide future protection of these riparian areas during oil and gas exploration and development. Each of these riparian area within the project area was field checked (see attach survey sheets) and determined to be unsuitable for cuckoo nesting; however, these riparian areas do provide opportunities for cuckoos during migration (stop over habitat). The NSO classification should provide protection to riparian areas and provide opportunities for potential migrating cuckoos. No significant direct or indirect impacts to cuckoos are anticipated. The proposed project “may affect, but would not likely adversely affect” cuckoos.</p> |                  |             |
| NI                   | Wastes<br>(hazardous or solid)          | There are currently no known issues associated with the proposed lease areas.   | D. Corry         | 9/6/16      |
| NI                   | Water Resources/Quality<br>(drinking/su | Leasing activities would not have an impact on these resources; however there is a possibility that exploration and development could occur in the future. If development is proposed, water resources may be impacted,   | D. Corry         | 9/6/16      |

| Determination | Resource                 | Rationale for Determination*  | Signature | Date     |
|---------------|--------------------------|---|-----------|----------|
|               | Surface/groundwater<br>) | these actions should be analyzed in a separate NEPA documents at the time of the proposed development.  |           |          |
| NI            | Wetlands/Riparian Zones  | <p>Leasing activities would not have an impact on these resources; however there is a possibility that exploration and development could occur in the future. If development is proposed, riparian resources may be impacted, these actions should be analyzed in a separate NEPA documents at the time of the proposed development.</p> <p>Portions of parcels UT-0517-042, UT-0517-443 and UT-0517-044 are within 200 meters of riparian areas and therefore stipulation UT-S-125 and Lease notice UT-LN-93 and UT-LN-95 should be applied to these parcels.</p>  | D. Corry  | 9/6/16   |
| NP            | Wild and Scenic Rivers   | There are no eligible, suitable, or designated, Wild and Scenic River segments within, or adjacent to the proposed lease parcels  | D. Kiel   | 10/4/16  |
| NI            | Wilderness/WSA           | <p>Designated wilderness is present within proposed lease parcel UT-0517-044. The southwestern tip of the Blackridge Wilderness overlaps the lease parcel by 3.3 acres and shares a common boundary with the wilderness for approximately 0.44 miles. Because it is designated wilderness, 40 acres including the 3.3 acres was removed from leasing availability. This reduces the available leasing acreage in parcel UT-0517-044 from 1,925 to 1,880.00 and eliminates the potential for impacts to wilderness.</p> <p>While the potential exists for impacts to designated wilderness from potential drilling operations on lease parcel UT-0517-044, the Omnibus Public Lands Management Act of 2009 (OPLMA) states:</p> <p>SEC. 1972. WILDERNESS AREAS.</p> | D. Kiel   | 12/19/16 |

| <b>Determination</b> | <b>Resource</b>                              | <b>Rationale for Determination*</b>   | <b>Signature</b> | <b>Date</b> |
|----------------------|--|---|------------------|-------------|
|                      |  | <p>(b) ADMINISTRATION OF WILDERNESS AREAS.—</p> <p>(4) BUFFER ZONES.—</p> <p>(A) IN GENERAL.—Nothing in this section creates a protective perimeter or buffer zone around any area designated as wilderness by subsection (a)(1).</p> <p>(B) ACTIVITIES OUTSIDE WILDERNESS.—The fact that an activity or use on land outside any area designated as wilderness by subsection (a)(1) can be seen or heard within the wilderness shall not preclude the activity or use outside the boundary of the wilderness.</p> |                  |             |
| NI                   | Woodland / Forestry                          | Leasing activities would have little impact on the Woodland/Forestry resource. The impact would happen if and when actual drilling etc. occurs on the parcel. If drilling is proposed, then the appropriate NEPA and its associated checklist will address impacts.   | D. Corry         | 9/6/16      |
| NP                   | Vegetation Excluding USFW Designated Species | No BLM Sensitive plant species are known to occur in the project area.  | B. Douglas       | 10/5/16     |
| PI                   | Visual Resources                             | The BLM uses a Visual Resource Management (VRM) system to inventory and manage visual resources on public lands. The primary objective of VRM is to manage visual resources so that the quality of scenic (visual) values is protected appropriately for the relevant management class. The VRM system uses four management classes (and their associated visual resource objectives) to describe the different degrees of surface disturbance or modification allowed on the                                     | D. Kiel          | 10/4/16     |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>landscape.</p> <p><u>VRM Class Objectives</u></p> <p>Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low. VRM Class I areas are typically reserved for designated wilderness or other high quality landscapes where preservation is a high priority.</p> <p>Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape</p> <p>Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> |           |      |

| Determination | Resource | Rationale for Determination*   | Signature | Date |
|---------------|----------|--|-----------|------|
|               |          | <p>Class IV: The objective of this class is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of the landscape.</p> <p>The proposed lease parcels would encompass VRM management classes II and III.</p> <p><u>Parcel UT0517-042</u></p> <p>VRM II 1501 acres</p> <p>VRM III: 100 acres</p> <p><u>Parcel UT0517-043</u></p> <p>VRM II: 1224</p> <p>VRM III: 28</p> <p><u>Parcel UT0517-044</u></p> <p>VRM I: 3.3 acres</p> <p>VRM III: 1884 acres</p> |           |      |

| Determination | Resource    | Rationale for Determination*  | Signature | Date   |
|---------------|-------------|---|-----------|--------|
|               |             | <p>The issuance of leases would not directly impact Visual Resources. However, as the BLM generally cannot deny all surface use of a lease unless the lease is issued as a No Surface Occupancy stipulation, the issuance of leases does convey an expectation that drilling and development would occur. For the purposes of this analysis, impacts to visual resources would be considered relevant if the impacts of the proposed project do not conform to an area's designated visual resource management (VRM) class objectives.</p> <p>The potential direct adverse impacts to visual resources would include the visual contrasts created by construction equipment, pipelines, well pads, temporary and permanent access roads, and other forms of infrastructure associated with oil and gas exploration and development. In general, drilling rigs and equipment, construction and maintenance vehicles, development infrastructure, and surface disturbance, including roads, would impact an area's scenic quality and appearance of naturalness with human-made form, color, and linear contrasts. A visual contrast rating process will be used for the VRM analysis, which involves comparing the project features with the major features in the existing landscape to determine whether the Scenic Values of the BLM managed lands within each parcel have been maintained when an APD is received and if the areas are proposed for exploration.</p> |           |        |
| NP            | Wild Horses | Not present in the project area   | D. Corry  | 9/6/16 |

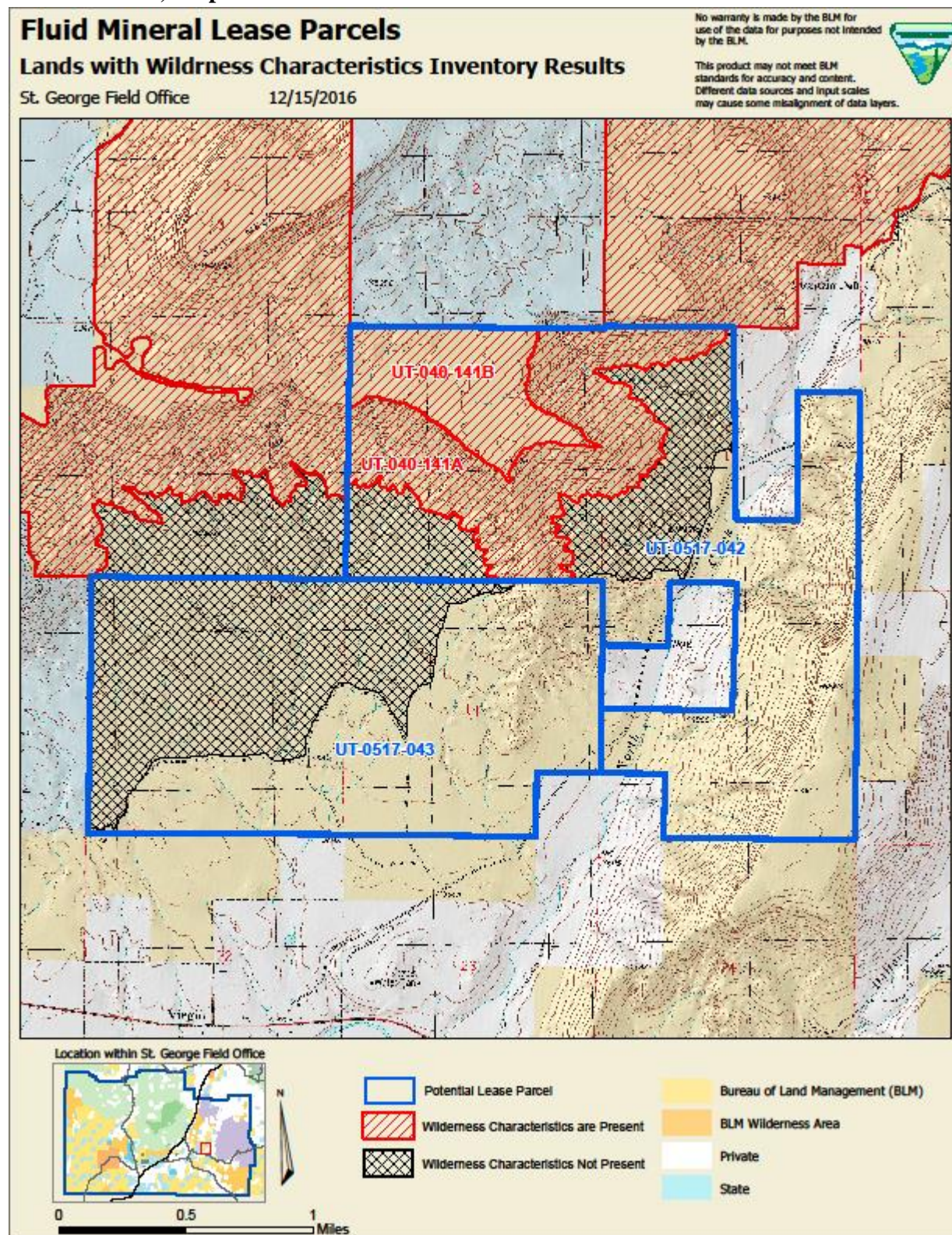
| Determination | Resource                              | Rationale for Determination*   | Signature | Date    |
|---------------|---------------------------------------|--|-----------|---------|
|               | and Burros                            |  |           |         |
| PI            | Lands with Wilderness Characteristics | Proposed lease parcels UT0517-042 and UT-517-043 contain approximately 595 acres of lands with wilderness characteristics. BLM documented the presence of wilderness characteristics in the Smith Mesa unit (UT-040-141) in August 2012. | D. Kiel   | 10/4/16 |

FINAL REVIEW:

| Reviewer Title            | Signature | Date | Comments |
|---------------------------|-----------|------|----------|
| Environmental Coordinator |           |      |          |
| Authorized Officer        |           |      |          |



## APPENDIX E, Map of Lands With Wilderness Characteristics



## APPENDIX F, Lands With Wilderness Characteristics Inventory

### 6301 – Wilderness Characteristics Inventory (Public)

#### **FORM 2**

#### **Current Conditions: Presence or Absence of Wilderness Characteristics**

Area Unique Identifier Smith Mesa UT-040-141A Acreage 2,729.93

(1) Is the area of sufficient size?

**Yes** ☒ **No**

#### Description:

UT-040-141A is a sub-section of the Smith Mesa UT-040-141 inventory unit. The area meets the criteria for size as defined in Section 2(c) of the Wilderness Act incorporated in the Federal Land Policy Management Act of 1976. The overall acreage of unit 141 is 11,968 acres, fulfilling the requirement of sufficient size as to make practicable its preservation and use in an unimpaired condition. Section 141A makes up 2,729.93 acres of the total acreage (11,967.80) of unit UT-040-141.

Section 141A adjoins sections 141B and 141D to the north. A small portion of land near the north central section of 141A is bounded by State Institutional Trust Lands. The eastern boundary is composed of private land and the Kolob Terrace Road. The southern portion of the 141A inventory unit is adjacent to lands managed by the St. George, Utah Bureau of Land Management Field Office. The western boundary consists of a small portion of Bureau of Land Management lands, private property and State Institutional Trust Lands.

There are 7 routes in this area (141AR001, 141AR002, 141AR003, 141AR004, 141AR005, 141AR006, 141AR007). There are no right-of-ways associated with these routes. The Flying Monkey downhill mountain bicycle trail, 141AR002, is located in the central part of unit 141A. All routes with the exception of the steep, downhill part of 141AR002 are user-created OHV and 4x4 routes. For more information on inventoried routes, refer to Appendix C – Route Analysis.

(2) Does the area appear to be natural?

**Yes** ☒ **No** ☐ **N/A**

#### Description:

All lands within section 141A are managed by the Bureau of Land Management St. George Field Office. The parcel is located in Washington County northeast of Virgin, Utah.

Most of the inventory unit 141A is located in lower elevations, just southeast of the relatively flat, higher-elevation plateau known as Smith Mesa. The topography consists of steep, eroded badlands of sedimentary rock, numerous deep, dry drainages and rolling desert lowlands. Dry Creek, a perennial stream drainage roughly divides Smith Mesa into eastern and western portions, empties into North Creek in the northeastern section of the parcel along the Kolob Terrace Road. Many large sandstone and basalt boulders are present throughout the inventory unit. The vegetation in the northernmost portion of the unit is characterized by pinion and juniper trees, cheat grass, low shrubs and small cacti. Larger trees, such as cottonwood and oak are present in major drainages, such as Dry Creek. The southernmost portion of the unit just north of Virgin, Utah 141A is more arid, with mixed sagebrush, low shrubs, agaves and more cacti growing in cryptobiotic soil crust.

The area lies within the boundaries of four grazing allotments, “Mountain Dell,” “Dry Creek,” “Oil Well” and “Virgin.” Of these, “Dry Creek,” located in the middle of parcel 141A, is the only allotment which is currently inactive and has been in non-use since 1994. All other grazing allotments within this parcel are currently active, and many areas appeared heavily grazed by cattle on the date of inventory, as evidenced by frequent areas of bare or trampled ground, numerous footprints, large amounts of dung and sightings of cattle.

**Exclusion:**

The impacts of motorized recreation and high concentration of dispersed campsites in the northwest corner, southern portions and eastern fringes of 141A interfere with the natural character of the landscape to the extent that a portion of section 141A was excluded from consideration during the wilderness characteristics inventory.

These areas of 141A are heavily used by OHVs along user-created recreational routes. There are several major routes in this area with spur trails branching off of them. Multiple dispersed campsites were observed in the area and most have been littered badly. In addition, numerous juniper trees have been cut along roads and near campsites in the area

Because OHVs cannot access the rugged terrain beyond a certain elevation , the southern boundary of 141A was drawn along the 4000ft elevation contour in the foothills of Smith Mesa to exclude most motorized intrusions into the remaining parcel.

With the exception of the portions excluded from the inventory, the area appears natural to the average visitor with signs of human impacts being substantially unnoticeable.

Overall, the area appears natural to the average visitor with signs of human impacts being substantially unnoticeable. Besides grazing, primary human uses are recreational and include both primitive and off-highway vehicle motorized recreation.

(3) Does the area have outstanding opportunities for solitude?

Yes **No** **X** N/A

**Description:**

Section 141A is bounded on three sides by continuously used roads. Vehicle traffic noise is pervasive and omnipresent from the bordering Kolob Terrace road and Highway 9.

Section 141A is bounded on the east by the Kolob Terrace Road. In the majority of section 141A, the sights and sounds of vehicular traffic are pervasive and omnipresent from this road, which receives intensive use during summer months, when many tourists use it to access the upper plateaus of Zion National Park. Some noise is reduced due to topographic buffers near the Dry Creek stream bed in the northeast area of 141A.

The majority of the section also includes visual impacts from power lines, roads, and built structures in the area. The badlands in the southern portion of the unit provide fair topographic screening, but this area is generally unprotected from the combined sights and sounds of bordering Utah Highway 9, the Kolob Terrace Road and the community of Virgin, Utah.



(4) Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for primitive and unconfined recreation?

**Yes X** No N/A

**Description:**

Opportunities for primitive and unconfined recreation exist within inventory unit 141A. The perennial riparian corridor along Dry Creek makes this area especially attractive for primitive recreation such as hiking, backpacking, horseback riding, off-trail exploration, scenic photography, sightseeing, wildlife-watching and hunting

(5) Does the area have supplemental values (ecological, geological, or other features of scientific, educational, scenic or historical value)?

**Yes X** No N/A

Numerous paleontological sites are located in the northwest corner of section 141A. The perennial riparian corridor of Dry Creek is a valuable resource for water and wildlife habitat in this arid region.

**Summary of Analysis\***

**Area Unique Identifier:** Smith Mesa UT-040-141A

**Summary**

It was determined that parcel UT-040-141A has wilderness characteristics. The area meets the criteria for naturalness based on substantially unnoticeable impacts from humans. It does not meet the criteria for solitude because in most areas, visitors cannot easily avoid the sights, sounds and evidence of other people due to the surrounding combined influences of Utah Highway 9, the Kolob Terrace Road and the community of Virgin, Utah. However, there are a number of primitive, unconfined types of recreation in the parcel. Visitors may enjoy recreational opportunities for hiking, backpacking, photography, exploration and sightseeing.

**Results of analysis**

1. Does the area meet any of the size requirements? **Yes X** No
2. Does the area appear to be natural? **Yes X** No N/A
3. Does the area offer outstanding opportunities for solitude or a primitive and unconfined type of recreation? **Yes X** No N/A
4. Does the area have supplemental values? **Yes X** No N/A

Check one:

**X** The area, or a portion of the area, has wilderness characteristics and is identified as Land with Wilderness Characteristics (LWC).

\_\_\_ The area does not have wilderness characteristics.

Prepared by (team members):

Melissa Buchmann

Braden Yardley

1/30/12

Reviewed by (District or Field Manager):

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\* This form documents information that constitutes and inventory finding on wilderness characteristics. It does not represent a formal land use allocation or a final agency decision subject to administrative remedies under either 43 CFR parts 4 or 1610.5-3.

### **6301 – Wilderness Characteristics Inventory (Public)**

#### **FORM 2**

#### **Current Conditions: Presence or Absence of Wilderness Characteristics**

Area Unique Identifier Smith Mesa UT-040-141B Acreage: 4746.17

(1) Is the area of sufficient size?

**Yes** **X** No

Description (describe the boundaries of the area--wilderness inventory roads, property lines, etc.):

UT-040-141B is a sub-section of the Smith Mesa UT-040-141 inventory unit. Most lands within section 141B are managed by the Bureau of Land Management St. George Field Office. The parcel is located in Washington County just north of Virgin, Utah. The area meets the criteria for size as defined in Section 2(c) of the Wilderness Act incorporated in the Federal Land Policy Management Act of 1976. The overall acreage of unit 141 is 11,968 acres, fulfilling the requirement of sufficient size as to make practicable its preservation and use in an unimpaired condition. Section 141B makes up 4746.17 acres of the total acreage of unit UT-040-141. Section 141B adjoins sections 141A and 141D to the south and east and 141C to the north. The boundary of 141B encompasses 1,313 acres of State Institutional Trust Lands, which were excluded from the inventory. The western boundary roughly parallels the Smith Mesa dirt road and adjoins State Trust Land, private land and BLM land managed by the St. George, Utah Bureau of Land Management Field Office.

Twelve routes were inventoried within and near section 141B (141BR001, 141B R002, 141B R003, 141B R004, 141B R005, 141B R006, 141B R007, 141B R008, 141B R009, 141BR010, 141BR011, 141BR012, 141BR013, 141BR014). Some inventoried routes were later determined to be outside the unit entirely, but were still included in the inventory.

There are no right-of-ways associated with any of these routes. The trailhead of the Flying Monkey downhill mountain bicycle trail, 141AR002 is located in the far southern part of unit 141B. All routes (with the exception of a portion of 141BR005, 141BR006 and 141BR010) are user-created OHV and 4x4 routes. For more information on inventoried routes, refer to Appendix C – Route Analysis.

(2) Does the area appear to be natural?

**Yes** **X** No N/A

#### **Discription**

Most of the inventory unit 141B is located on Smith Mesa, a high, relatively flat plateau north of Virgin, Utah. Dry Creek is a major drainage which runs north-south along the eastern edge of the unit.

The topography consists of high sandstone plateaus surrounded by deep canyons. Exposed sandstone outcroppings characterize the area geologically.

A thick pinion-juniper forest dominates the landscape, with small shrubs growing in between. It should be noted that a small section of the proposed parcel was affected by a wildfire in 2006, which is apparent from the charred juniper snags in the vicinity.

**Exclusion:**

Two parcels of State Institutional Trust Lands totaling 1,313 acres were excluded from the inventory because they are outside the jurisdiction of the BLM.

With the exception of the portion excluded from the inventory, the area appears natural to the average visitor with signs of human impacts being substantially unnoticeable.

(3) Does the area have outstanding opportunities for solitude?

**Yes** ☒ **No** ☐ **N/A**

Most of section 141B offers outstanding opportunities for solitude. The combination of thick pinion-juniper forest and undulating topography offers superior topographic and vegetative screening, allowing visitors to avoid the sights and sounds of other people in most areas.

(4) Does the area (or the remainder of the area if a portion has been excluded due to unnaturalness and the remainder is of sufficient size) have outstanding opportunities for primitive and unconfined recreation?

**Yes** ☒ **No** ☐ **N/A**

Primitive recreational opportunities in this area include, but are not limited to hiking, backpacking, horseback riding, off-trail exploration, photography, sightseeing, bird watching, and hunting.

(5) Does the area have supplemental values?

**Yes** ☒ **No** ☐ **N/A**

**Description:**

The perennial riparian corridor of Dry Creek in the northeast section is a valuable resource for water and wildlife habitat in this arid region.

**Summary of Analysis\***

**Area Unique Identifier:**

**Summary**

Results of analysis:

It was determined that the parcel UT-040-141B has wilderness characteristics.

Along with sections 141A, 141C and 141D, it meets the size requirements for wilderness characteristics.

Besides the excluded area on state land, section 141B meets the naturalness criteria because the landscape appears natural to the lay observer.

It meets the criteria for solitude because in most areas, visitors can easily avoid the sights, sounds and evidence of other people through vegetative and topographic screening.

Primitive, unconfined recreational opportunities abound in this area because visitors may enjoy many types of non-motorized recreation including hiking, off-trail exploration, backpacking, horseback riding, sightseeing, photography and hunting.

Dry Creek was considered a supplemental value, as it is a valuable resource for water and wildlife habitat in this arid region.

1. Does the area meet any of the size requirements? **Yes X** No
  2. Does the area appear to be natural? **Yes X** No N/A
  3. Does the area offer outstanding opportunities for solitude or a primitive and unconfined type of recreation? **Yes X** No N/A
  4. Does the area have supplemental values? **Yes X** No N/A
- Check one:

**X** The area, or a portion of the area, has wilderness characteristics and is identified as Land with Wilderness Characteristics (LWC).

\_\_\_ The area does not have wilderness characteristics.

Prepared by:

Melissa Buchmann

Braden Yardley

2/21/12 Reviewed by (District or Field Manager):

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

\* This form documents information that constitutes an inventory finding on wilderness characteristics. It does not represent a formal land use allocation or a final agency decision subject to administrative remedies under either 43 CFR parts 4 or 1610.5-3.

## APPENDIX G; Migratory Birds Occurring in Washington County Utah

### Birds Protected By The Migratory Bird Treaty Act Occurring in Washington County, Utah

| Common Name                 | Scientific Name           | Common Name              | Scientific Name               |
|-----------------------------|---------------------------|--------------------------|-------------------------------|
| Greater White-fronted Goose | <i>Anser albifrons</i>    | Hammond's Flycatcher     | <i>Empidonax hammondi</i>     |
| Snow Goose                  | <i>Chen caerulescens</i>  | Gray Flycatcher          | <i>Empidonax wrightii</i>     |
| Ross's Goose                | <i>Chen rossii</i>        | Dusky Flycatcher         | <i>Empidonax oberholseri</i>  |
| Canada Goose                | <i>Branta canadensis</i>  | Pacific-slope Flycatcher | <i>Empidonax difficilis</i>   |
| Trumpeter Swan              | <i>Cygnus buccinator</i>  | Cordilleran Flycatcher   | <i>Empidonax occidentalis</i> |
| Tundra Swan                 | <i>Cygnus columbianus</i> | Black Phoebe             | <i>Sayornis nigricans</i>     |
| Wood Duck                   | <i>Aix sponsa</i>         | Eastern Phoebe           | <i>Sayornis phoebe</i>        |
| Gadwall                     | <i>Anas strepera</i>      | Say's Phoebe             | <i>Sayornis saya</i>          |
| Eurasian Wigeon             | <i>Anas penelope</i>      | Vermilion Flycatcher     | <i>Pyrocephalus rubinus</i>   |
| American Wigeon             | <i>Anas americana</i>     | Ash-throated Flycatcher  | <i>Myiarchus cinerascens</i>  |
| Mallard                     | <i>Anas platyrhynchos</i> | Brown-crested Flycatcher | <i>Myiarchus tyrannulus</i>   |

|                           |                                  |                               |                                 |
|---------------------------|----------------------------------|-------------------------------|---------------------------------|
| Blue-winged Teal          | <i>Anas discors</i>              | Cassin's Kingbird             | Tyrannus vociferans             |
| Cinnamon Teal             | <i>Anas cyanoptera</i>           | Western Kingbird              | Tyrannus verticalis             |
| Northern Shoveler         | <i>Anas clypeata</i>             | Eastern Kingbird              | Tyrannus tyrannus               |
| Northern Pintail          | <i>Anas acuta</i>                | Loggerhead Shrike             | Lanius ludovicianus             |
| Green-winged Teal         | <i>Anas crecca</i>               | Northern Shrike               | Lanius excubitor                |
| Canvasback                | <i>Aythya valisineria</i>        | Bell's Vireo                  | Vireo bellii                    |
| Redhead                   | <i>Aythya americana</i>          | Gray Vireo                    | Vireo vicinior                  |
| Ring-necked Duck          | <i>Aythya collaris</i>           | Plumbeous Vireo               | Vireo plumbeus                  |
| Greater Scaup             | <i>Aythya marila</i>             | Cassin's Vireo                | Vireo cassinii                  |
| Lesser Scaup              | <i>Aythya affinis</i>            | Blue-headed Vireo             | Vireo solitarius                |
| Surf Scoter               | <i>Melanitta perspicillata</i>   | Warbling Vireo                | Vireo gilvus                    |
| White-winged Scoter       | <i>Melanitta fusca</i>           | Philadelphia Vireo            | Vireo philadelphicus            |
| Black Scoter              | <i>Melanitta nigra</i>           | Red-eyed Vireo                | Vireo olivaceus                 |
| Long-tailed Duck          | <i>Clangula hyemalis</i>         | Gray Jay                      | Perisoreus canadensis           |
| Bufflehead                | <i>Bucephala albeola</i>         | Steller's Jay                 | Cyanocitta stelleri             |
| Common Goldeneye          | <i>Bucephala clangula</i>        | Blue Jay                      | Cyanocitta cristata             |
| Barrow's Goldeneye        | <i>Bucephala islandica</i>       | Western Scrub-Jay             | Aphelocoma californica          |
| Hooded Merganser          | <i>Lophodytes cucullatus</i>     | Pinyon Jay                    | Gymnorhinus cyanocephalus       |
| Common Merganser          | <i>Mergus merganser</i>          | Clark's Nutcracker            | Nucifraga columbiana            |
| Red-breasted Merganser    | <i>Mergus serrator</i>           | Black-billed Magpie           | Pica hudsonia                   |
| Ruddy Duck                | <i>Oxyura jamaicensis</i>        | American Crow                 | Corvus brachyrhynchos           |
| Red-throated Loon         | <i>Gavia stellata</i>            | Common Raven                  | Corvus corax                    |
| Pacific Loon              | <i>Gavia pacifica</i>            | Horned Lark                   | Eremophila alpestris            |
| Common Loon               | <i>Gavia immer</i>               | Purple Martin                 | Progne subis                    |
| Yellow-billed Loon        | <i>Gavia adamsii</i>             | Tree Swallow                  | Tachycineta bicolor             |
| Pied-billed Grebe         | <i>Podilymbus podiceps</i>       | Violet-green Swallow          | Tachycineta thalassina          |
| Horned Grebe              | <i>Podiceps auritus</i>          | Northern Rough-winged Swallow | Stelgidopteryx serripennis      |
| Red-necked Grebe          | <i>Podiceps grisegena</i>        | Bank Swallow                  | Riparia riparia                 |
| Eared Grebe               | <i>Podiceps nigricollis</i>      | Cliff Swallow                 | Petrochelidon pyrrhonota        |
| Western Grebe             | <i>Aechmophorus occidentalis</i> | Barn Swallow                  | Hirundo rustica                 |
| Clark's Grebe             | <i>Aechmophorus clarkii</i>      | Black-capped Chickadee        | Poecile atricapillus            |
| American White Pelican    | <i>Pelecanus erythrorhynchos</i> | Mountain Chickadee            | Poecile gambeli                 |
| Double-crested Cormorant  | <i>Phalacrocorax auritus</i>     | Juniper Titmouse              | Baeolophus ridgwayi             |
| American Bittern          | <i>Botaurus lentiginosus</i>     | Verdin                        | Auriparus flaviceps             |
| Least Bittern             | <i>Ixobrychus exilis</i>         | Bushtit                       | Psaltiriparus minimus           |
| Great Blue Heron          | <i>Ardea herodias</i>            | Red-breasted Nuthatch         | Sitta canadensis                |
| Great Egret               | <i>Ardea alba</i>                | White-breasted Nuthatch       | Sitta carolinensis              |
| Snowy Egret               | <i>Egretta thula</i>             | Pygmy Nuthatch                | Sitta pygmaea                   |
| Reddish Egret             | <i>Egretta rufescens</i>         | Brown Creeper                 | Certhia americana               |
| Cattle Egret              | <i>Bubulcus ibis</i>             | Cactus Wren                   | Campylorhynchus brunneicapillus |
| Green Heron               | <i>Butorides virescens</i>       | Rock Wren                     | Salpinctes obsoletus            |
| Black-crowned Night-Heron | <i>Nycticorax nycticorax</i>     | Canyon Wren                   | Catherpes mexicanus             |
| White-faced Ibis          | <i>Plegadis chihi</i>            | Bewick's Wren                 | Thryomanes bewickii             |
| Wood Stork                | <i>Mycteria americana</i>        | House Wren                    | Troglodytes aedon               |
| Turkey Vulture            | <i>Cathartes aura</i>            | Winter Wren                   | Troglodytes troglodytes         |
| California Condor         | <i>Gymnogyps californianus</i>   | Marsh Wren                    | Cistothorus palustris           |
| Osprey                    | <i>Pandion haliaetus</i>         | American Dipper               | Cinclus mexicanus               |
| White-tailed Kite         | <i>Elanus leucurus</i>           | Golden-crowned Kinglet        | Regulus satrapa                 |
| Bald Eagle                | <i>Haliaeetus leucocephalus</i>  | Ruby-crowned Kinglet          | Regulus calendula               |
| Northern Harrier          | <i>Circus cyaneus</i>            | Blue-gray Gnatcatcher         | Poliophtila caerulea            |
| Sharp-shinned Hawk        | <i>Accipiter striatus</i>        | Black-tailed Gnatcatcher      | Poliophtila melanura            |
| Cooper's Hawk             | <i>Accipiter cooperii</i>        | Eastern Bluebird              | Sialia sialis                   |
| Northern Goshawk          | <i>Accipiter gentilis</i>        | Western Bluebird              | Sialia mexicana                 |
| Common Black-Hawk         | <i>Buteo gallus anthracinus</i>  | Mountain Bluebird             | Sialia currucoides              |
| Red-shouldered Hawk       | <i>Buteo lineatus</i>            | Townsend's Solitaire          | Myadestes townsendi             |
| Broad-winged Hawk         | <i>Buteo platyterus</i>          | Veery                         | Catharus fuscescens             |
| Swainson's Hawk           | <i>Buteo swainsoni</i>           | Swainson's Thrush             | Catharus ustulatus              |
| Zone-tailed Hawk          | <i>Buteo albonotatus</i>         | Hermit Thrush                 | Catharus guttatus               |
| Red-tailed Hawk           | <i>Buteo jamaicensis</i>         | Rufous-backed Robin           | Turdus rufopalliat              |
| Ferruginous Hawk          | <i>Buteo regalis</i>             | American Robin                | Turdus migratorius              |
| Rough-legged Hawk         | <i>Buteo lagopus</i>             | Varied Thrush                 | Ixoreus naevius                 |
| Golden Eagle              | <i>Aquila chrysaetos</i>         | Gray Catbird                  | Dumetella carolinensis          |
| American Kestrel          | <i>Falco sparverius</i>          | Northern Mockingbird          | Mimus polyglottos               |
| Merlin                    | <i>Falco columbarius</i>         | Sage Thrasher                 | Oreoscoptes montanus            |



|                        |                         |                             |                           |
|------------------------|-------------------------|-----------------------------|---------------------------|
| Peregrine Falcon       | Falco peregrinus        | Brown Thrasher              | Toxostoma rufum           |
| Prairie Falcon         | Falco mexicanus         | Bendire's Thrasher          | Toxostoma bendirei        |
| Virginia Rail          | Rallus limicola         | Curve-billed Thrasher       | Toxostoma curvirostre     |
| Sora                   | Porzana carolina        | Crissal Thrasher            | Toxostoma crissale        |
| Common Moorhen         | Gallinula chloropus     | Le Conte's Thrasher         | Toxostoma lecontei        |
| American Coot          | Fulica americana        | American Pipit              | Anthus rubescens          |
| Sandhill Crane         | Grus canadensis         | Bohemian Waxwing            | Bombycilla garrulus       |
| Black-bellied Plover   | Pluvialis squatarola    | Cedar Waxwing               | Bombycilla cedrorum       |
| American Golden-Plover | Pluvialis dominica      | Phainopepla                 | Phainopepla nitens        |
| Snowy Plover           | Charadrius alexandrinus | Tennessee Warbler           | Vermivora peregrina       |
| Semipalmated Plover    | Charadrius semipalmatus | Orange-crowned Warbler      | Vermivora celata          |
| Killdeer               | Charadrius vociferus    | Nashville Warbler           | Vermivora ruficapilla     |
| Mountain Plover        | Charadrius montanus     | Virginia's Warbler          | Vermivora virginiae       |
| Black-necked Stilt     | Himantopus mexicanus    | Lucy's Warbler              | Vermivora luciae          |
| American Avocet        | Recurvirostra americana | Northern Parula             | Parula americana          |
| Spotted Sandpiper      | Actitis macularius      | Yellow Warbler              | Dendroica petechia        |
| Solitary Sandpiper     | Tringa solitaria        | Chestnut-sided Warbler      | Dendroica pensylvanica    |
| Wandering Tattler      | Tringa incana           | Magnolia Warbler            | Dendroica magnolia        |
| Greater Yellowlegs     | Tringa melanoleuca      | Black-throated Blue Warbler | Dendroica caerulescens    |
| Willet                 | Tringa semipalmata      | Yellow-rumped Warbler       | Dendroica coronata        |
| Lesser Yellowlegs      | Tringa flavipes         | Black-throated Gray Warbler | Dendroica nigrescens      |
| Whimbrel               | Numenius phaeopus       | Townsend's Warbler          | Dendroica townsendi       |
| Long-billed Curlew     | Numenius americanus     | Hermit Warbler              | Dendroica occidentalis    |
| Marbled Godwit         | Limosa fedoa            | Yellow-throated Warbler     | Dendroica dominica        |
| Red Knot               | Calidris canutus        | Grace's Warbler             | Dendroica graciae         |
| Sanderling             | Calidris alba           | Prairie Warbler             | Dendroica discolor        |
| Semipalmated Sandpiper | Calidris pusilla        | Palm Warbler                | Dendroica palmarum        |
| Western Sandpiper      | Calidris mauri          | Blackpoll Warbler           | Dendroica striata         |
| Least Sandpiper        | Calidris minutilla      | Black-and-white Warbler     | Mniotilta varia           |
| Baird's Sandpiper      | Calidris bairdii        | American Redstart           | Setophaga ruticilla       |
| Pectoral Sandpiper     | Calidris melanotos      | Prothonotary Warbler        | Protonotaria citrea       |
| Dunlin                 | Calidris alpina         | Worm-eating Warbler         | Helminthos vermivorum     |
| Stilt Sandpiper        | Calidris himantopus     | Northern Waterthrush        | Seiurus noveboracensis    |
| Short-billed Dowitcher | Limnodromus griseus     | Louisiana Waterthrush       | Seiurus motacilla         |
| Long-billed Dowitcher  | Limnodromus scolopaceus | Kentucky Warbler            | Oporornis formosus        |
| Wilson's Snipe         | Gallinago delicata      | MacGillivray's Warbler      | Oporornis tolmiei         |
| Wilson's Phalarope     | Phalaropus tricolor     | Common Yellowthroat         | Geothlypis trichas        |
| Red-necked Phalarope   | Phalaropus lobatus      | Hooded Warbler              | Wilsonia citrina          |
| Red Phalarope          | Phalaropus fulicarius   | Wilson's Warbler            | Wilsonia pusilla          |
| Franklin's Gull        | Larus pipixcan          | Painted Redstart            | Myioborus pictus          |
| Bonaparte's Gull       | Larus philadelphia      | Yellow-breasted Chat        | Icteria virens            |
| Heermann's Gull        | Larus heermanni         | Summer Tanager              | Piranga rubra             |
| Ring-billed Gull       | Larus delawarensis      | Scarlet Tanager             | Piranga olivacea          |
| California Gull        | Larus californicus      | Western Tanager             | Piranga ludoviciana       |
| Herring Gull           | Larus argentatus        | Green-tailed Towhee         | Pipilo chlorurus          |
| Sabine's Gull          | Xema sabini             | Spotted Towhee              | Pipilo maculatus          |
| Black-legged Kittiwake | Rissa tridactyla        | Abert's Towhee              | Pipilo aberti             |
| Least Tern             | Sternula antillarum     | Rufous-crowned Sparrow      | Aimophila ruficeps        |
| Caspian Tern           | Hydroprogne caspia      | American Tree Sparrow       | Spizella arborea          |
| Black Tern             | Chlidonias niger        | Chipping Sparrow            | Spizella passerina        |
| Common Tern            | Sterna hirundo          | Clay-colored Sparrow        | Spizella pallida          |
| Forster's Tern         | Sterna forsteri         | Brewer's Sparrow            | Spizella breweri          |
| Band-tailed Pigeon     | Patagioenas fasciata    | Black-chinned Sparrow       | Spizella atrogularis      |
| White-winged Dove      | Zenaida asiatica        | Vesper Sparrow              | Poocetes gramineus        |
| Mourning Dove          | Zenaida macroura        | Lark Sparrow                | Chondestes grammacus      |
| Inca Dove              | Columbina inca          | Black-throated Sparrow      | Amphispiza bilineata      |
| Common Ground-Dove     | Columbina passerina     | Sage Sparrow                | Amphispiza belli          |
| Ruddy Ground-Dove      | Columbina talpacoti     | Lark Bunting                | Calamospiza melanocorys   |
| Yellow-billed Cuckoo   | Coccyzus americanus     | Savannah Sparrow            | Passerculus sandwichensis |
| Greater Roadrunner     | Geococcyx californianus | Grasshopper Sparrow         | Ammodramus savannarum     |
| Barn Owl               | Tyto alba               | Fox Sparrow                 | Passerella iliaca         |
| Flammulated Owl        | Otus flammeolus         | Song Sparrow                | Melospiza melodia         |
| Western Screech-Owl    | Megascops kennicottii   | Lincoln's Sparrow           | Melospiza lincolni        |
| Great Horned Owl       | Bubo virginianus        | Swamp Sparrow               | Melospiza georgiana       |
| Northern Pygmy-Owl     | Glaucidium gnoma        | White-throated Sparrow      | Zonotrichia albicollis    |
| Elf Owl                | Micrathene whitneyi     | Harris's Sparrow            | Zonotrichia querula       |

|                                |                            |                            |                               |
|--------------------------------|----------------------------|----------------------------|-------------------------------|
| Burrowing Owl                  | Athene cunicularia         | White-crowned Sparrow      | Zonotrichia leucophrys        |
| Spotted Owl                    | Strix occidentalis         | Golden-crowned Sparrow     | Zonotrichia atricapilla       |
| Long-eared Owl                 | Asio otus                  | Dark-eyed Junco            | Junco hyemalis                |
| Short-eared Owl                | Asio flammeus              | McCown's Longspur          | Calcarius mcconnii            |
| Northern Saw-whet Owl          | Aegolius acadicus          | Lapland Longspur           | Calcarius lapponicus          |
| Lesser Nighthawk               | Chordeiles acutipennis     | Chestnut-collared Longspur | Calcarius ornatus             |
| Common Nighthawk               | Chordeiles minor           | Snow Bunting               | Plectrophenax nivalis         |
| Common Poorwill                | Phalaenoptilus nuttallii   | Rose-breasted Grosbeak     | Pheucticus ludovicianus       |
| Black Swift                    | Cypseloides niger          | Black-headed Grosbeak      | Pheucticus melanocephalus     |
| Chimney Swift                  | Chaetura pelagica          | Blue Grosbeak              | Passerina caerulea            |
| Vaux's Swift                   | Chaetura vauxi             | Lazuli Bunting             | Passerina amoena              |
| White-throated Swift           | Aeronautes saxatalis       | Indigo Bunting             | Passerina cyanea              |
| Broad-billed Hummingbird       | Cynanthus latirostris      | Dickcissel                 | Spiza americana               |
| Blue-throated Hummingbird      | Lampornis clemenciae       | Bobolink                   | Dolichonyx oryzivorus         |
| Magnificent Hummingbird        | Eugenes fulgens            | Red-winged Blackbird       | Agelaius phoeniceus           |
| Ruby-throated Hummingbird      | Archilochus colubris       | Western Meadowlark         | Sturnella neglecta            |
| Black-chinned Hummingbird      | Archilochus alexandri      | Yellow-headed Blackbird    | Xanthocephalus xanthocephalus |
| Anna's Hummingbird             | Calypte anna               | Rusty Blackbird            | Euphagus carolinus            |
| Costa's Hummingbird            | Calypte costae             | Brewer's Blackbird         | Euphagus cyanocephalus        |
| Calliope Hummingbird           | Stellula calliope          | Common Grackle             | Quiscalus quiscula            |
| Broad-tailed Hummingbird       | Selasphorus platycercus    | Great-tailed Grackle       | Quiscalus mexicanus           |
| Rufous Hummingbird             | Selasphorus rufus          | Bronzed Cowbird            | Molothrus aeneus              |
| Belted Kingfisher              | Megascyle alcyon           | Brown-headed Cowbird       | Molothrus ater                |
| Lewis's Woodpecker             | Melanerpes lewis           | Orchard Oriole             | Icterus spurius               |
| Red-headed Woodpecker          | Melanerpes erythrocephalus | Hooded Oriole              | Icterus cucullatus            |
| Acorn Woodpecker               | Melanerpes formicivorus    | Bullock's Oriole           | Icterus bullockii             |
| Williamson's Sapsucker         | Sphyrapicus thyroideus     | Altamira Oriole            | Icterus gularis               |
| Yellow-bellied Sapsucker       | Sphyrapicus varius         | Scott's Oriole             | Icterus parisorum             |
| Red-naped Sapsucker            | Sphyrapicus nuchalis       | Gray-crowned Rosy-Finch    | Leucosticte tephrocotis       |
| Red-breasted Sapsucker         | Sphyrapicus ruber          | Black Rosy-Finch           | Leucosticte atrata            |
| Ladder-backed Woodpecker       | Picoides scalaris          | Pine Grosbeak              | Pinicola enucleator           |
| Downy Woodpecker               | Picoides pubescens         | Cassin's Finch             | Carpodacus cassinii           |
| Hairy Woodpecker               | Picoides villosus          | House Finch                | Carpodacus mexicanus          |
| American Three-toed Woodpecker | Picoides dorsalis          | Red Crossbill              | Loxia curvirostra             |
| Northern Flicker               | Colaptes auratus           | Pine Siskin                | Carduelis pinus               |
| Olive-sided Flycatcher         | Contopus cooperi           | Lesser Goldfinch           | Carduelis psaltria            |
| Western Wood-Pewee             | Contopus sordidulus        | Lawrence's Goldfinch       | Carduelis lawrencei           |
| Willow Flycatcher              | Empidonax traillii         | American Goldfinch         | Carduelis tristis             |
| Least Flycatcher               | Empidonax minimus          | Evening Grosbeak           | Coccothraustes vespertinus    |

*Source: Birds Protected By the Migratory Bird Treaty Act (Code of Federal Regulations, Part 10, March 1, 2010); and Birds of Washington County, Utah, 2007, Compiled by Rick Fridell (Utah Division of Wildlife Resources, St. George, Utah), and Kristen Comella (Utah Division of Parks and Recreation, Snow Canyon Park, Ivins, Utah).*

## APPENDIX H, BIRDS OF CONSERVATION CONCERN (USFWS 2008) OCCURRING IN WASHINGTON COUNTY

**Table \_Birds of Conservation Concern (BCC) Occurring In Washington County, Utah**

| Common Name      | Scientific Name          | Primary Habitats Used          | Status In Washington County, Utah   |
|------------------|--------------------------|--------------------------------|-------------------------------------|
| Eared Grebe      | Podiceps nigricollis     | Aquatic, Riparian              | Winter Resident                     |
| American Bittern | Botaurus lentiginosus    | Aquatic, Riparian              | Transient (Spring & Fall migration) |
| Least Bittern    | Ixobrychus exilis        | Aquatic, Riparian              | Accidental (few records)            |
| Bald Eagle       | Haliaeetus leucocephalus | Pinyon-juniper, Riparian       | Winter Resident                     |
| Ferruginous Hawk | Buteo regalis            | Not Restricted                 | Permanent Resident                  |
| Golden Eagle     | Aquila chrysaetos        | Not Restricted                 | Permanent Resident                  |
| Peregrine Falcon | Falco peregrinus         | Cliffs, Riparian               | Permanent Resident                  |
| Prairie Falcon   | Falco mexicanus          | Cliffs, Desert Shrub, Riparian | Permanent Resident                  |
| Snowy Plover     | Charadrius alexandrinus  | Aquatic, Riparian              | Transient (Spring & Fall migration) |

|                            |                           |                                |                                     |
|----------------------------|---------------------------|--------------------------------|-------------------------------------|
| Mountain Plover            | Charadrius montanus       | Farmlands                      | Accidental (few records)            |
| Whimbrel                   | Numenius phaeopus         | Aquatic, Riparian              | Transient (Spring & Fall migration) |
| Long-billed Curlew         | Numenius americanus       | Grassland, Aquatic             | Transient (Spring & Fall migration) |
| Marbled Godwit             | Limosa fedoa              | Aquatic, Riparian              | Transient (Spring & Fall migration) |
| Red Knot                   | Calidris canutus          | Aquatic, Riparian              | Accidental (few records)            |
| Yellow-billed Cuckoo       | Coccyzus americanus       | Riparian                       | Summer Resident (nesting season)    |
| Flammulated Owl            | Otus flammeolus           | Pinyon-juniper                 | Summer Resident (nesting season)    |
| Elf Owl                    | Micrathene whitneyi       | Riparian                       | Summer Resident (nesting season)    |
| Burrowing Owl              | Athene cunicularia        | Grassland, Sagebrush           | Permanent Resident                  |
| Black Swift                | Cypseloides niger         | Cliffs, Riparian               | Transient (Spring & Fall migration) |
| Costa's Hummingbird        | Calypte costae            | Sagebrush, Riparian            | Summer Resident (nesting season)    |
| Calliope Hummingbird       | Stellula calliope         | Mountain Shrub, Riparian       | Transient (Spring & Fall migration) |
| Lewis's Woodpecker         | Melanerpes lewis          | Mountain Shrub, Riparian       | Permanent Resident                  |
| Williamson's Sapsucker     | Sphyrapicus thyroideus    | Riparian                       | Summer Resident (nesting season)    |
| Willow Flycatcher          | Empidonax traillii        | Riparian                       | Summer Resident (nesting season)    |
| Loggerhead Shrike          | Lanius ludovicianus       | Desert Shrub, Sagebrush        | Permanent Resident                  |
| Bell's Vireo               | Vireo bellii              | Riparian                       | Summer Resident (nesting season)    |
| Gray Vireo                 | Vireo vicinior            | Pinyon-juniper, Mountain Shrub | Summer Resident (nesting season)    |
| Pinyon Jay                 | Gymnorhinus cyanocephalus | Pinyon-juniper                 | Permanent Resident                  |
| Juniper Titmouse           | Baeolophus ridgwayi       | Pinyon-juniper                 | Permanent Resident                  |
| Veery                      | Catharus fuscescens       | Riparian                       | Accidental (few records)            |
| Sage Thrasher              | Oreoscoptes montanus      | Sagebrush                      | Transient (Spring & Fall migration) |
| Bendire's Thrasher         | Toxostoma bendirei        | Desert Shrub, Sagebrush        | Summer Resident (nesting season)    |
| Le Conte's Thrasher        | Toxostoma lecontei        | Desert Shrub                   | Accidental (few records)            |
| Virginia's Warbler         | Vermivora virginiae       | Mountain Shrub, Riparian       | Summer Resident (nesting season)    |
| Lucy's Warbler             | Vermivora luciae          | Riparian                       | Summer Resident (nesting season)    |
| Grace's Warbler            | Dendroica graciae         | Pinyon-juniper, Conifer        | Summer Resident (nesting season)    |
| Green-tailed Towhee        | Pipilo chlorurus          | Mountain Shrub                 | Summer Resident (nesting season)    |
| Brewer's Sparrow           | Spizella breweri          | Sagebrush                      | Summer Resident (nesting season)    |
| Black-chinned Sparrow      | Spizella atrogularis      | Mountain Shrub, Sagebrush      | Summer Resident (nesting season)    |
| Sage Sparrow               | Amphispiza belli          | Desert Shrub, Sagebrush        | Permanent Resident                  |
| Grasshopper Sparrow        | Ammodramus savannarum     | Grasslands                     | Transient (Spring & Fall migration) |
| Chestnut-collared Longspur | Calcarius ornatus         | Grasslands, Desert Shrub       | Accidental (few records)            |
| Black Rosy-Finch           | Leucosticte atrata        | Cultivated Fields, Riparian    | Winter Resident                     |
| Cassin's Finch             | Carpodacus cassinii       | Pinyon-juniper, Ponderosa Pine | Permanent Resident                  |
| Lawrence's Goldfinch       | Carduelis lawrencei       | Riparian, Cultivated Fields    | Accidental (few records)            |

*Source: Species list was obtained from two sources; 1) Birds of Conservation Concern Plan, 2008, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia; and 2) Birds of Washington County, Utah, 2007, Compiled by Rick Fridell (Utah Division of Wildlife Resources, St. George, Utah, and Kristen Comella (Utah Division of Parks and Recreation, Snow Canyon Park, Ivins, Utah).*

## APPENDIX I, RESPONSE TO COMMENTS